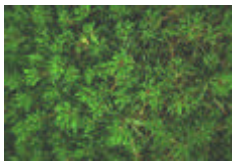
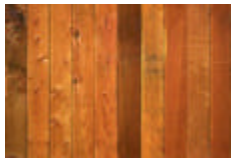
A Study into the development of Sustainability Rating for Homes

Advisory Committee on Consumer Products and the Environment

BioRegional Development Group





Final Report

May 2003

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BioRegional

BioRegional Development Group is an independent environmental organization implementing real-life, commercially viable solutions for sustainable living – *bringing local sustainability into the mainstream.*

BioRegional have recently been involved in the design and construction of an urban eco-village in South London, Beddington Zero (fossil) Energy Development, or BedZED. Designed with architect Bill Dunster and developed in partnership with the Peabody Trust.

BioRegional is currently engaged in some further projects relating to our experience at BedZED and the monitoring the development in use. BioRegional also provide consultancy services to Local Authorities, building professionals and other parties with an interest in sustainable living.

The Stockholm Environment Institute (SEI, www.seiy.org) is an independent, international research institute specialising in sustainable development and environment issues. It works at local, national, regional and global policy levels. The SEI research programmes aim to clarify the requirements, strategies and policies for a transition to sustainability. These goals are linked to the principles advocated in Agenda 21 and the Conventions such as Climate Change, Ozone Layer Protection and Biological Diversity.

SEI's mission is to support decision-making and induce change towards sustainable development around the world by providing integrative knowledge that bridges science and policy in the field of environment and development.

BRE is the UK's leading centre of expertise on buildings, construction, energy, environment, fire and risk. They provide research-based consultancy, testing and certification services to customers world-wide. The BRE:

- Provide a complete range of consultancy, testing and commissioned research services covering all aspects of the built environment, and associated industries
- Make significant contributions to the developments of national and international standards and codes for construction and fire safety
- Through our sister company, BRE Certification, provide certification to UK, European and international standards, as well as CE marking and product approval
- Via BRE Training and Education offers a wide spread of courses covering the built environment, company management, marketing and other topics

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1 The scope of this study and main findings

BioRegional Development Group has been commissioned by the Department for Environment, Food and Rural Affairs (DEFRA) on behalf of the Advisory Committee on Consumer Products and the Environment (ACCPE), to complete a study into the potential role of a homes eco-label. It is proposed that such a tool could be used by all players in the housing market to promote more sustainable homes.

The study focuses on exploring how the Building Research Establishment's existing EcoHomes scheme might be developed into a scheme covering all homes and the possible scope to base it on the widely recognised A-G format of the EU energy label.

In addition ACCPE wish to compare this BRE eco-rating approach with ecological footprinting methodology, to see to what extent the two methodologies yield similar ratings.

The main findings and recommendations are:

1.1 An eco-label for homes could be a useful tool to promote improved sustainability performance of homes. It could potentially be used by a range of stakeholders including local authority planning departments, developers, mortgage lenders and consumers. A homes eco-label has the potential to create a common language in the whole supply chain – something which does not exist at the moment.

1.2 An eco-label for homes should probably cover a range of sustainability criteria, not simply energy-efficiency. Currently the only label which does so is BRE EcoHomes. However, BRE EcoHomes currently applies only to new build and refurbishment, although there are proposals to develop a system for assessing second-hand (existing) properties. EcoHomes appears the most suitable 'existing label' contender for development into a sustainability rating scheme for homes, but with development to facilitate its use to assess existing homes and individual homes more simply. The label will also probably need to evolve its standards over time, to reflect changes in best practice and technologies available.

1.3 As over 90% of homes sold are second-hand properties, an eco-label for homes should ideally cover existing properties as well. There is scope for an eco-label to build on the Energy Report required as part of the Home Condition Report of the Home Information Pack in the Government's proposed Housing Bill. The eco-label would need to be re-assessed periodically to reflect changes made to a home over its lifespan and to changes in eco-label standards. The proposed sustainability label should stay with the homes as it is sold and resold in the future. The eco-label could be used like an "MOT for homes" whenever a home is sold or rented, ensuring the home is fit for purpose and not polluting the environment.

1.4 It is not anticipated that ratings would need to be 'date stamped' (e.g. C-rated 2003) to aid consumer awareness despite the fact that the assessment criteria and scoring bands will change over time with each revision of the label. It is proposed that a new assessment will be required whenever a property is sold and hence every home on the market will be required to have a current sustainability rating awarded under the latest edition of the label.

1.5 Care will be needed in the formulation of a sustainability rating regarding the relative scoring of new and old homes. There are potential issues regarding either encouraging the refurbishment of older homes when new ones would be better, or artificially boosting the new homes sector through 'writing off' large amounts of existing stock.

1.6 For assessing individual and existing homes, an eco-labelling scheme would need to be more straightforward and simpler to complete than the current EcoHomes scheme. The assessment would need to be designed so that it could be carried out at a cost (in terms of time and money) which the market could bear.

1.7 EcoHomes is designed so that developers can build homes that find a balance between different issues; this has the aim of trying to reduce the likelihood of any of the relevant issues being taken to the negative extreme. We believe that the current configuration of EcoHomes which allows potential 'trade-offs' between sections is, on balance, the best way to both achieve sector acceptance of the scheme and still encourage innovation.

1.8 A combination of carrot and stick will be required to ensure uptake of the eco-label. Key in the new build sector will be local authorities, who are keen to promote sustainable development and can require a certain level of sustainability performance before granting planning permission, or can incentivise improvements in performance through "planning gain". There is scope to offer carrots via say preferential mortgages, reductions in Stamp Duty and stimulating consumer demand. Although initially introduced as a voluntary scheme, for a significant impact on the homes market, any eco-label in the medium to long term should become a mandatory one. The standards could be incorporated in Building Regulations. If a label were to be transformed into a mandatory requirement, governance of schemes such as BRE EcoHomes would need to be reviewed in light of the implications in competition law.

1.9 There are a number of points in the existing supply chain where an eco-label can be introduced and assessed, building on current industry practice rather than creating a new tier of regulation. The costs of doing so need to be investigated in more detail and areas where, for instance, the BRE EcoHomes process could be simplified and hence reduced in cost, have been identified. The creation of an industry standard in sustainability through an eco-label could reduce costs for a number of players in the supply chain who currently spend a lot of time in negotiation on sustainability standards (e.g. local planning authorities and developers negotiating planning permission).

1.10 It is our conclusion that the label should have a tiered format comprising three levels of information and detail presented in a transparent manner. The stages would be: A-G Headline Score, Background Criteria Scores, and the Detailed Report.

1.11 Environmental analysis, including eco-footprinting assessment, highlights the fact that the majority of our environmental impacts as consumers, and hence potential savings, are attributable to lifestyle decisions and not the materials used in the products themselves. None of the existing rating schemes for homes or labels for consumer products considers how the consumer uses the product and whether their use patterns are sustainable. However, the way a product is designed can encourage a particular lifestyle or behaviour.

1.12 It may be useful to harmonise any eco-label such as BRE EcoHomes with methodologies such as ecological footprinting, and an initial investigation of this has been carried out.

2 Why are our homes so important to achieving a sustainable future?

Over half of all of the resources consumed globally are used in construction, and 45% of energy generated across the world is used to heat, light and ventilate our buildings with a further 5% arising from constructing them[1]. Addressing the environmental sustainability of the construction and occupation of buildings is of great importance.

In achieving a sustainable future we need not only to consider the homes themselves, but also their relationship to the infrastructure which supports them, e.g. transport, work, leisure, food supply and waste recycling.

As a direct consequence of increased human activity and industrialisation, the concentration of greenhouse gases (carbon dioxide, methane and nitrous oxide) in the atmosphere continues to rise. Climate predictions indicate that a rise in global temperatures of between 1.4 and 5.8 °C by the end of the 21st century is expected. Although CO_2 is less potent than other greenhouse gases on an equal mass basis, the quantity of emissions is so large that it remains the main contributor to climate change.

On 24th February 2003, the government published the long-awaited White Paper on energy, *Our energy future – creating a low carbon economy*; the Paper acknowledges that current energy strategy will be unable to meet future challenges and outlines changes in energy policy. The government have identified the target of achieving a 60% reduction in carbon dioxide emissions by 2050 (a target recommended by the International Panel on Climate Change), this is to be primarily met through reducing consumption and boosting the use of renewable energy sources. In achieving this long term target and an intermediate reduction target of 15-25 million tonnes of carbon (MtC) by 2020, energy efficiency is identified as delivering half of the necessary improvements.

As the CO_2 emissions attributable to the construction and occupation our homes equates to approximately 27% of all CO_2 emissions in the UK[2], it is clear that the sustainability of our homes will play a pivotal role in achieving our sustainable future. In the White Paper, the government have expressed their aims for improving the energy performance of homes in the UK by bringing forward the next revision of the Building Regulations to 2005, and stating their aim to ensure that every home is adequately and affordably heated with nobody living in fuel poverty by 2016-18. The White Paper indicates that 4-6 MtC of the total 15-20 MtC reductions by 2020, could be achieved through energy efficiency in households.

One of the first principles of designing environmentally sustainable communities is to construct energy efficient buildings at high densities around transportation interchanges; this can greatly reduce the energy demand and associated carbon dioxide emissions (such communities are advocated by Richard Rogers in *Cities for a small planet*[3]). These communities will need to integrate a variety of residential, commercial and leisure uses so that most facilities are within walking distance with efficient public transport making it easier to live without a car. Ideally, in these compact communities, heat and power are generated locally and they are supported by a hinterland growing food and providing space for recreation and wildlife habitats.

In 2001, the existing stock of homes in England totalled 21.3 million dwellings and housing starts totalled 162,000 (having averaged 175,000 per year over the previous decade). From this it appears that 'churn' in the homes sector is at a rate of less than 1% per year. The rate of

[1] Brian Edwards (2001), '*Rough Guide to Sustainability*', RIBA Publications, London
[2] Urban Task Force (1999), '*Towards an Urban Renaissance*', E & FN Spon, London
[3] Richard Rogers (1997), '*Cities for a small planet*' , Faber and Faber, London

replacement of housing stock is considerably smaller, figures for 1999/2000 show that of the 141,700 houses completed in that year, only 700 represented replacement of the housing stock, the other 141,000 were net additions to the stock[4].

It is clear that if we want to stand a chance of meeting future targets for reducing CO_2 emissions in this country, such as those recommended by the International Panel on Climate Change (IPCC) and adopted by the London Sustainable Development Commission (LDSC), it is critical that we also address the sustainable occupancy of existing homes. Concentrating on building new energy efficient and sustainable homes will take around a century to have a substantial effect on the performance of the UK housing stock, if we continue to replace our old stock at the present rate.

The London Sustainable Development Commission has recommended the reduction of CO_2 emissions in London of 20% from 1990 levels by 2010. This target would be seen as the first stage in the process that would lead to a minimum target of 60% reductions in CO_2 emissions by 2050.

To meet recommended CO_2 emissions reductions, challenging targets will have to be set for new build for example. It has been calculated by the LSDC that to help achieve the 2050 target, all new developments in London from now on should be CO_2 neutral, and that a 40% saving in current fuel use is also required for all existing developments. These figures were calculated using current domestic fabric renewal rates and predicted housing stock numbers for London over the next 50 years. As the homes built today will still be in use in 60+ years, the 2050 target was viewed as the most important for the construction sector to address now.

Despite the predicted decline in CO_2 emissions after 2005, Cambridge Econometrics[5] reports that the attainment of the government's domestic goal of a 20% reduction in the 1990 level of CO_2 emissions by 2010 appears to be unattainable without significant new policy measures. By 2010, household carbon emissions are expected to be 26% above the 1990 level and they, along with road transport, remain formidable barriers to progress towards the government's 20% domestic carbon reduction target.

3 Existing home rating schemes and legislation

It is important when investigating the issues surrounding the future development of a sustainability rating scheme for homes, to discuss and appraise any existing initiatives and to discuss their relative strengths and weaknesses, success and failures.

3.1 Standard Assessment Procedure (SAP)

Home energy rating schemes offer a way of comparing the amount of fuel energy (GJ/annum) that would be used by different homes assuming that the occupants live in them in the same way. The Government's own scoring system is called the Standard Assessment Procedure (SAP) measured on a scale from 1-120. The higher numbers indicate more energy efficient homes that should be cheaper to run and easier to keep warm.

We understand that DEFRA are involved in the development of a scheme called FasterSAP with the aim of reducing time and cost implications for the assessment of existing properties. Under

[4] http://www.construction-forecast.com
[5] http://www.camecon.co.uk

the scheme, tabulated information and assumptions will be used to ensure compatibility with the full SAP methodology. This obviously raises potential problems with regards to assessing unusual properties which do not fit in with any banding or typical dwelling types.

3.2 NHER

The National Energy Foundation developed the first commercially available energy rating system (National Home Energy Rating Scheme - NHER) for use on British homes. It was launched in 1990 and was the first to achieve BS EN ISO 9002 quality assurance and Government approval for delivery of SAP ratings in 1993.

NHER professes to be the UK's leading energy rating scheme in delivering energy efficiency advice, tackling fuel poverty and developing local and regional improvement strategies. The scheme can be used to calculate energy ratings for existing, refurbished or new build homes; from on-site surveys or building plans. NHER can also be used to calculate an affordable warmth index which is used to combat fuel poverty in hard to heat homes.

Members of NHER include more than 200 Local Authorities, over 130 housing associations, 8 energy suppliers, over 900 builders, the NHBC and Zurich Municipal, and more than 250 consultants, architects and surveyors.

The Building Research Establishment (BRE) has commissioned research into domestic energy use for many years. Hundreds of homes were surveyed to ascertain their energy features, and then monitored for up to two years to see how they actually performed in terms of temperatures, hot water consumption and fuel bills. From this BRE was able to develop its Domestic Energy Model (BREDEM) that is used as the basis for both NHER and SAP scales.

NHER is a measure of the energy efficiency of dwellings in terms of energy running costs. The energy used in the dwelling is calculated using a detailed model which takes into account the location of the dwelling, it's design, construction and insulation, as well as the space and water heating systems, the appliances used and the factors which affect the ventilation of the dwelling. For calculating the rating a standard occupancy is assumed in which the number of occupants is estimated from the dwelling floor area and a standard heating pattern assumed.

The energy consumption figures are converted to energy costs using average fuel prices and the fuel price index. This leads to the calculation of the energy costs per square metre on which the actual NHER is based. The result is a rating on a scale of 0-10 where ‘0’ represents an extremely inefficient dwelling and ‘10’ an extremely efficient dwelling.

The methodology behind the NHER assessment takes into account all the factors which are known to affect the actual energy running costs. Thus the programme incorporates models of the effects of draught-proofing, heating controls, and orientation and exposure of the dwelling, as well as the obvious model required for estimating space heating energy from the level of insulation, areas of external elements, and heating system efficiency.

The National Energy Foundation state that the National Home Energy Rating is recognised as the only fully comprehensive system for evaluating the energy efficiency of dwellings.

The NHER (National Home Energy Rating) score is measured on a scale of 0 to 10 and an estimate of the amount of carbon dioxide emitted (tonnes/annum) each year as a result of the home's energy use. The Government has produced a technical Carbon Index as one of the ways of satisfying the 2002 Building Regulations in England and Wales (see section below).

3.3 Differences between SAP and NHER

It should be noted that the SAP and NHER scales measure slightly different things: the SAP looks only at the fixed elements of the home and is the same wherever the property is located in the UK. All homes built to the same design should have exactly the same SAP. The NHER however includes various location-specific elements (including whether the home is South facing or sheltered from wind by other buildings) and so reflects actual running costs. If two homes have the same floor area but different NHER scores, then the home with the better (higher) NHER should cost less to run.

3.4 Building Regulations (implications of 2002 changes)

The new Building Regulations took effect on 1st April 2002 in England and Wales, and there are major changes on the conservation of the fuel and power from the 1995 edition. As a result of the Kyoto Protocol and UK government targets to reduce carbon dioxide emissions, the new Approved Documents L1 and L2 have switched to a measurement based on carbon output. The legal requirements set out under Approved Document L1: *Conservation of fuel and power in dwellings* are as follows:

'Reasonable provision shall be made for the conservation of fuel and power in dwellings by:

a) Limiting heat loss:
- *i. through the fabric of the building;*
- *ii. from hot water pipes and hot air ducts used for space heating;*
- *iii. from hot water vessels;*

b) providing space heating and hot water systems which are energy efficient;

c) providing lighting systems with appropriate lamps and sufficient controls so that energy can be used efficiently;

d) providing sufficient information with the heating and hot water services so that building occupiers can operate and maintain the services in such a manner as to use no more energy than is reasonable in the circumstances.'

Under Approved Document L1 (for dwellings), there are three possible routes to compliance:

- Elemental method
- Target U-value method
- Carbon index method

Elemental method
This method can only be used if the heating system in the dwelling is of an appropriate type, i.e. gas- or oil-fired boiler with good seasonal efficiency, a heat pump, community heating with combined heat and power (CHP) and biogas or biomass fuel. This method is most suitable for alterations, extensions and for new-build work when it is required to minimise calculations.

Target U-value method
This method can be used for any type of heating system and allows for a greater flexibility than the elemental method with the building envelope.

Carbon index method
This method provides even more flexibility in the design of new dwellings whilst achieving similar overall performance to the other two methods. The Standard Assessment Procedure (SAP 1998 worksheet) has been extended to incorporate the calculation of the carbon index.

3.5 SAP method of compliance with Building Regulations

Both Part L1 and Part J of UK Building Regulations require the Standard Assessment Procedure to be used to determine the Carbon Index. SAP ratings can be calculated by means of using an approved computer program or completing the standard calculation sheet published by the BRE taking into account the following:

- dwelling's size
- ventilation
- U-values
- heating systems
- hot water system
- solar heat gain
- fuel cost for hot water, necessary pumps, fans

Any competent person can complete and submit a SAP calculation, although it is common for third parties to be paid to carry out the calculation.

To comply with Building Regulations using the SAP method, a rating of 80 to 85 has to be achieved depending on the floor area of the dwelling. Without an efficient heating system this target is difficult to meet. A typical detached dwelling meeting the *Elemental* or *Target* U-value targets may achieve a SAP of 60 to 70. Hence, the SAP target of 80+ is very difficult to achieve through the use of cheaper standard constructions. Under the Building Regulations, a SAP rating has to be submitted to the Local Authority when a new house is complete and the SAP certificate must be displayed on new premises[6].

In their recent White Paper on energy, the government has expressed their aims for improving the energy performance of homes in the UK by bringing forward the next revision of Part L of the Building Regulations to 2005. It is anticipated that the revisions will further tighten the standards for all new buildings, refurbishments and improvements such as boiler replacements.

3.6 House Builders Federation

Following the changes to the Building Regulations requiring the display of SAP rating certificates in new homes, the HBF launched a new energy label with the aim of illustrating the energy-efficiency of a new home at a glance. The scheme has colour-coded bandings in a similar style to the EU energy label for domestic appliances. The chart compares the energy rating of the new home in question against other new homes and the average for new and old homes. During the period of writing this study, we were unable to obtain further details on the scheme from the HBF.

[6] A recent report by National Energy Services and De Montfort University (selling the SAP – a research study into the display of energy ratings in private sector new homes) has found that over 95% of sites failed to comply with the current Building Regulations requirement to display SAP energy ratings.

3.7 NHBC

The National House-Building Council (NHBC) is the leading warranty and insurance provider for new homes in the UK. They provide buyers of new homes with a 10 year 'Buildmark' warranty and insurance protection. Currently over 1.6 million homes in the UK are protected by the 'Buildmark' warranty and over time NHBC has inspected and provided protection to nearly six million homes.

The NHBC's primary purpose is to help raise standards in the new house-building industry. Their two main customers are registered house builders and homebuyers, this combination of roles together with the structure of core activities and services, aims to drive improvements in industry standards and enable improvements in the quality of the UK housing. This 'virtuous circle' is achieved through:

- Registering builders who must comply with NHBC's Rules and Standards
- Setting Technical Standards for new homes
- Performing inspections at key stages of construction
- Providing "Buildmark" warranty and insurance cover
- Offering a range of complementary professional services including engineering, energy rating, training and health and safety to the house building industry

NHBC Energy Rating Services help to provide housing that is economic in its energy demands. NHBC carries out 6,000 home energy ratings each year providing independent technical advice to builders enabling them to optimise energy efficiency and select cost-effective designs and materials. As well as helping to protect the environment, this work on energy efficiency specifically aids the home owner by making the running costs of a house more affordable.

As part of their commitment to sustainable homes, the NHBC financially supported the Building Research Establishment in their development of *EcoHomes—The Environmental Rating for Homes*, and its companion publication *The Green Guide to Housing Specification*, both published in 2000.

3.8 EcoHomes

EcoHomes assessments can be carried out at the design stage in a similar way to a SAP rating. Every house type on a site is considered, but the award is given for the whole development. This enables the developers to use the result to promote whole sites – every house that is part of the development has the same rating.

EcoHomes considers the broad environmental concerns of climate change, resource and impact on wildlife, and balances these against the need for a high quality of life, and a safe and healthy internal environment. All the issues in EcoHomes are optional, making it flexible and enabling developers to adopt the appropriate aspects of sustainability for their particular development and market.

The issues assessed are grouped into the seven categories below:

- Energy
- Transport
- Water
- Land Use and ecology
- Pollution
- Health and well-being
- Materials

EcoHomes is the homes version of BREEAM (the BRE Environmental Assessment Method). BREEAM leads the world in setting benchmarks for the environmental performance of buildings. It is independent, authoritative and based on many years of construction and environmental research carried out by the BRE, the construction industry and Government.

EcoHomes is a reasonably straightforward, flexible and independently verified environmental assessment method. Environmental performance is expressed on a scale of Pass to Excellent.

It is an easily understood, credible label for new and renovated homes including houses and apartments. The credibility of the scheme originates from the fact that the scheme is a partnership of industry and environmental organisations. It rewards developers who improve environmental performance through good design, rather than high capital cost solutions. Benefits include:

- Demonstrating sustainability credentials to planning authorities to assist a smooth passage through the planning process.
- Demonstrating 'green' credentials to investors helps to minimise investment risk and increase the appeal to ethical investors.
- Demonstrating superior environmental design to customers.
- Allowing developers to be one step ahead of regulation.

4 Limitations of existing Home Labels

The schemes identified above have been initiated and/or supported by various organisations at different times, to address and compare different issues in response to differing identified needs. Each has their own relative strengths, weaknesses and effectiveness in promoting improvement in the sector.

It is an important part of this study to assess the potential of any of the existing schemes for development into an eco-rating scheme which is suitable for both new and second-hand homes. Some schemes, such as SAP and NHER, can be used in theory to assess the energy efficiency performance of all homes, although the practicalities of completing assessments on existing stock can be more complicated and commonly tables of 'average' performance data are used. EcoHomes can only be used in its current form to assess new homes and refurbishments.

Out of the assessment procedures considered, only the Buildings Regulations with the associated SAP rating requirement constitute an inclusive label. This is because their completion is mandatory under legislation covering the development of new dwellings and refurbishments. The majority of environmental labelling schemes (across all product and service sectors) are exclusive, rewarding the top 20% or so of products in the particular sector. In Ernst &Young's report[7] for the DETR on existing eco-labelling schemes, it is stated that the fact that most environmental labels are exclusive reflects one of their typical aims, to reward innovative solutions whilst encouraging firms performing outside of the top range to improve. The report concludes that *'…inclusive labels are of a greater attraction to industry, but an inclusive approach must set high standards and monitor performance. Taking an inclusive approach does not preclude the possibility of launching separate exclusive, reward-style initiatives'.*

EcoHomes is the only scheme which considers sustainability more widely, unlike the other schemes listed it assesses more than simply the energy efficiency of the home.

[7] Ernst & Young and Atlantic Consulting (1999), '*Environmental Labelling of Consumer Products: Lessons for the UK Market from Existing Schemes'*.

As approximately two-thirds of our individual CO_2 emissions in the UK are attributable to our lifestyles more generally (including food and transport)[8], it is desirable that a future eco-rating label for homes should assess more than energy efficiency alone to represent a more accurate picture of sustainability. For example, is an energy efficient home which can only be accessed by a 20 mile car journey really sustainable?

There is substantial research and consideration behind the development of the EcoHomes scheme and there appears to be little benefit in starting from scratch with the development of a new scheme. With these aspects in mind, EcoHomes appears the most suitable contender for development into a sustainability rating scheme for homes, but with development to facilitate its use for assessing existing homes. Issue relating to this are discussed in greater detail later in this study.

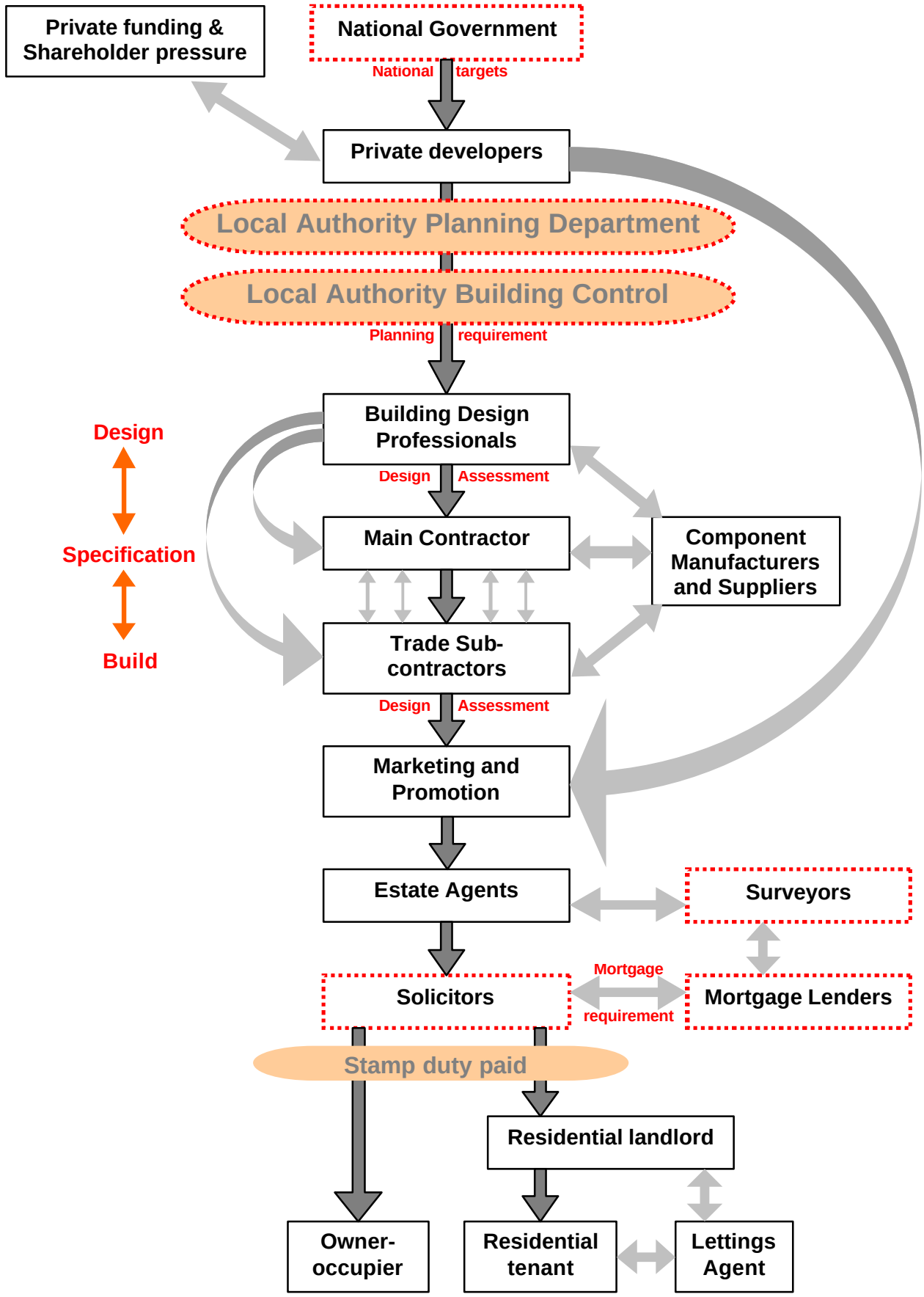
Home Label	Pros	Cons
SAP	o Can be used to assess new homes, existing homes and refurbishments o Well established o Now compulsory for new homes	o Only covers energy efficiency o Does not consider orientation or location o Potentially difficult to assess existing homes
NHER	o Can be used to assess new homes, existing homes and refurbishments o Takes account of orientation and location o Calculates CO_2 emissions and energy costs per m2	o Only covers energy efficiency and anticipated running costs
Building Regulations	o Mandatory assessment o Very well established	o Only covers energy efficiency o Does not reward innovation or promote building above minimum requirements
HBF	o Based on SAP assessment o Enables 'easy' comparison between new homes and value for average UK home	o Applies to new homes only o Not widely known or publicised o Only covers energy efficiency
NHBC	o Offer technical advice on energy efficient design and materials	o Only covers energy efficiency o Applies to new homes only
EcoHomes	o Only scheme to assess sustainability and not just energy efficiency. Important in terms of industry acceptability and not 'reinventing the wheel' o Aims to encourage innovation and promote building above minimum requirements o Label can be used to demonstrate sustainability credentials to: planning authorities, investors, developers and customers o Scheme is already in a 'rating scale' format	o Can only be applied to new homes and refurbishment

5 The UK homes sector

To understand the limitations and opportunities for developing a sustainability rating for homes, it is critical to understand the supply chain for new and second-hand homes. A further important element is to identify who the key players are in the supply chain and to elaborate on the relationships between them and their relative motivations and obligations. An understanding of the different roles, responsibilities and inter-reactions is critical to identifying potential obstacles to implementing any future sustainability labels. It is also important to understand the size and 'make-up' of the homes sector in terms of occupancy and ownership.

[8] Figures first widely published by Professor Brenda Vale and Dr. Robert Vale in their books *The Autonomous House* (1975) and *Green Architecture* (1991).

6 The 'private sector new homes' market



The design, procurement and purchase of new homes in the private sector are represented diagrammatically above. As can be seen, it is a complex process with many parties involved, resulting in a complicated network of roles and responsibilities, but matched with many opportunities for sustainability assessment and promotion to take place. Such opportunities are indicated in red and in red dashed-line boxes on the diagram; these are discussed in a later section of this study.

6.1 Owner-occupied new build homes

The vast majority of new housing in this country is provided by private developers. In recent years, the majority of the larger housebuilders have been increasing their national coverage and market share through acquisitions and mergers. By 2001, the top 20 national housebuilders accounted for just over 49% of total new housing completions. The leading national housebuilders in 2001 were Persimmon, George Wimpey and Barratt Developments, which together accounted for an estimated 21% of the market in terms of completions[9].

The top national housebuilders have varying attitudes towards the importance of the sustainability of their products and the sector as a whole. It should be noted that the sustainability of homes is slowly moving up the agenda of housebuilders, however although many of them use the rhetoric, not all build to enable and promote sustainable living.

6.2 Potential points to apply eco-labels to new private sector homes

It is very unlikely that the key players in the housing sector, their inter-relationships or the basic overall format of the homes supply framework will change much in the foreseeable future, it is therefore important to look to opportunities within the existing landscape to encourage sustainability. On the diagram above, the dashed-line boxes indicate current and possible links in the chain where we believe a sustainability rating for homes could be promoted and/or assessed.

These are located at stages in the process of providing new homes for the private sector, they can be characterised as the following:

- **National Government legislation**
- **Local Authority assessment via Planning policy and/or Building Control**
- **At point of sale**

6.3 National Government Legislation

There is scope for an 'EcoHomes'-type sustainability label to become mandatory, perhaps as part of future changes to the Building Regulations. However, it is anticipated that this would require change in governance of the EcoHomes scheme to enable it to become mandatory, this would need to be explored further.

6.4 The Planning system

The aim of the planning system is to protect amenity and the environment in the interests of the general public. Within the framework of legislation approved by Parliament, councils should try to

[9] www.amaresearch.co.uk

ensure that development is allowed where required, whilst ensuring that the character and amenity of the area are not adversely affected by new buildings or alterations to the use of existing buildings or land.

The current situation means that major works need planning permission from the council - minor works do not. Councils can use planning controls to protect the character and amenity of their area, whilst individuals have a reasonable amount of freedom to change their property. Parliament has given the main responsibility for planning to local planning authorities. All new residential development is required to achieve planning permission and the current planning system offers the potential for local government to set standards for the level of sustainability performance required as a stipulation of awarding planning permission.

Many local authorities already refer to sustainability issues in the supplementary planning guidance (SPG), as well as in regional and local plans. Some authorities have also begun to specify exacting environmental/sustainability requirements as conditions of developing certain sites. Local authorities now frequently stipulate that new development should primarily be located on brownfield sites in existing urban areas and established town centres. Mixed-use higher density development with consideration of sustainable transport links are also often identified as being preferable for new developments.

Some councils are exploring the options of offering developers increased permitted development in exchange for meeting stricter environmental targets and introducing Green Travel Plans with reduced parking provision. Reference should be made to Draft Planning Brief for the Merton College site by London Borough of Merton as an example of this concept. Under the Merton planning brief, a greater number of homes can be built if higher environmental standards are achieved.

Local Authorities are beginning to investigate the potential EcoHomes offers as a measure of sustainability, London Borough of Brent refer to the scheme in their supplementary planning guidance and London Borough of Croydon require large developments to achieve the 'Excellent' rating. To our knowledge no authority has yet tested the legal implications of specifying an EcoHomes score as a condition of planning generally, although consultation with the Environmental Law Foundation (see appendix) suggests that such a route would be open to local authorities. It should be noted that from April 2003, all future housing association developments seeking Housing Corporation funding, will have to meet a minimum requirement of EcoHomes 'Pass', and that English Partnerships require proposed developments on their sites to score 'Very Good'.

6.5 At point of sale

It is important to note that the majority of progress towards developing sustainable homes to date has taken place in the social sector. This is probably due to a combination of factors.

Living in an energy and water efficient sustainable home can enable residents to reduce their energy and services demands which can result in homes that are cheaper to run and better for the environment. Housing associations, unlike private developers, take a long-term view on the dwellings they build because they have an obligation to keep them fit for habitation and affordable for their occupants. The role and responsibilities of a private developer in the delivery of a new home effectively ceases after the point of sale. Private developers have little or no interest in how sustainably the future occupants can live and how much energy their home uses.

Recent legislation requires that SAP calculations are completed and displayed for all new housing; this offers the house-buying public the opportunity to compare new dwellings in terms of

their predicted energy efficiency and hence anticipated running costs. **This requirement could be the basis of raising public awareness of the environmental impact of their homes, but longer term the assessment should be extended to cover sustainability issues beyond the energy efficiency of the home.** The information should be presented in a consumer-friendly format to best communicate the anticipated environmental and financial costs to the consumer to assist them in making their purchasing decision.

Housebuilders and developers could use sustainability to help sell their product. The introduction of a sustainability label for new homes would help inform the consumer regarding the impact and long-term implications of their purchasing decisions. This would hopefully increase consumer choice in the market as developers could build and promote 'eco-homes' and chose to exploit the reduced running costs and long-term 'saleability' of their products as a marketing device. One of the stakeholder group respondents stated that they thought an energy efficiency label had a role in the homes sector because currently consumers do not know if the home they are choosing is inefficient, or what the associated effects or impacts of their choice is.

One particular development where some sustainability principles appear to have been followed through from design to completion and marketing is the St James development in Northamptonshire. The scheme was developed by the Lifebuilding Company (a subsidiary of the Wilcon Group) with the remit of realising sustainable urban developments to help foster new belief in the idea of community. The development consists of 413 homes including 55 social rent units on a 17 acre brownfield site located close to the town centre. The development used sustainably sourced timber and high levels of insulation throughout, it offers waste separation facilities, efficient white goods. As a sign of the developer's confidence in the thermal building performance, they guarantee the heating bills for the first three years.

It should be noted that there are considerable shortfalls in the provision of homes in the UK, the number of homes built each year has been falling for decades, whilst the number of households has been rising. In this climate, new homes sell whether they are sustainable or not and developers know that they can almost guarantee that whatever they build will sell.

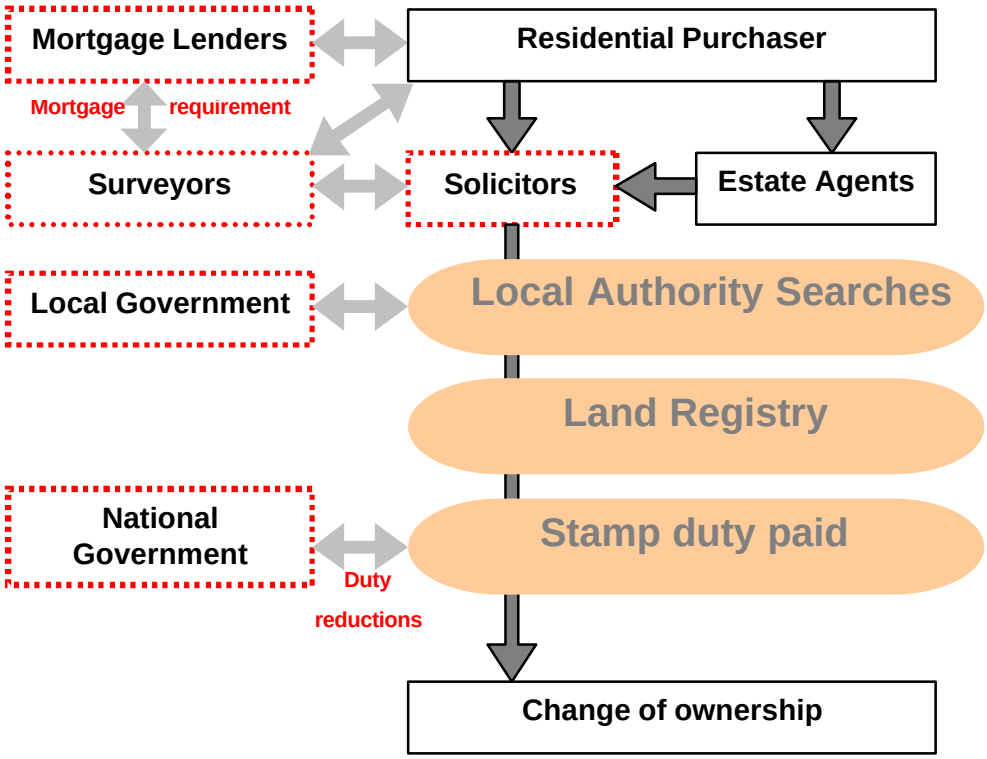
7 The 'private sector second hand homes' market

In 2001, house sales in the England and Wales totalled 1.458 million, in that same year there were 122,478 housebuilding completions. These two figures suggest that on the assumption that all houses completed in 2001 were sold that year, more than 90% of houses sold were from existing stock (Formal confirmation of the figure was not available from the Land Registry within the timescale of this study.]

The diagram below represents the process of buying/selling an existing home in the private sector. It does not indicate the position under the proposed Government legislation covering the introduction of a Home Information Pack. The proposals are discussed later in this study. Under the proposals the responsibility for producing a survey, known as a Home Condition Report falls to the vendor rather than the prospective buyer. The HCR will be an equivalent level survey to the current Royal Institute of Chartered Surveyors (RICS) Homebuyers Survey and Valuation.

On the diagram, the dashed-line boxes and indicate possible links in the chain where we believe a sustainability rating for homes could be promoted and/or assessed. These can be characterised as the following:

- **At point of (re)sale**
- **National Government legislation/incentives**



7.1 At point of (re)sale

There are proposed legislative changes planned which will affect the way homes are bought and sold, these changes have been primarily developed to make the process more transparent, certain, faster and consumer friendly, but they also potentially offer the opportunity for the inclusion of a sustainability assessment.

Legislation covering the changes was published in the draft Housing Bill on 31 March 2003. The main change is the introduction of a Home Information Pack which would be prepared by the vendor, or his agent, and used as a common source of information by sellers and prospective buyers. The proposed changes will therefore shift some of the transaction costs from the buyer to the seller, although for the majority of buyers and sellers the overall effect is relatively neutral.

7.2 Home Information Packs

The proposed Home Information Pack would include a Home Condition Report (HCR) which is broadly equivalent in content to the current Homebuyers Survey and Valuation (HSV) with the addition of an energy report. The aim of the HCR is to provide information to sellers and prospective buyers about the condition of the property before terms are negotiated, as the late availability of condition information frequently causes transactions to fail, or be delayed whilst renegotiations take place. At this point in time buyers are likely to be receptive to learning about the condition and the likely costs of ownership.

The purpose of the energy report is to provide specific information on how energy efficient the property is and to motivate owners to improve that efficiency by providing suggestions on the measures that could be adopted. Any recommendations to improve energy efficiency would be presented with an indication of costs, savings, payback period and reductions in CO_2 emissions. The building's fabric, services and structure will be assessed under the SAP rating scheme using a standard occupancy pattern to derive the anticipated energy efficiency and thus running costs (the rating is independent of occupation pattern, floor area and orientation). As the 'raw' number

is unlikely to mean much to the consumer, it is intended to use a banding rationale similar to energy labels used for white goods. Under such proposals, different properties can be compared to each other on this basis and to approximate values for typical UK stock homes. It is believed this comparative data may act as a driver for improvement, by encouraging vendors to present their properties in the best possible light before putting them on the market. **There appears to be considerable scope in the longer term, for the energy report as part of the Home Information Pack, to be extended into a sustainability rating and report.**

The Home Condition Report would be prepared by a certified home inspector (Home Inspectors Certification Board - www.thehicb.org.uk), with the SAP rating being calculated using approved software. Currently, the Building Regulations require all new domestic properties to be SAP rated and for that rating to be made available to the owner, the rating of existing dwellings is not yet a legal requirement, but the Home Information Pack legislation will effectively change this.

As part of our stakeholder consultation, a representative from the Office of the Deputy Prime Minister (ODPM) has indicated that it is not anticipated that new homes sold 'off plan'[10] would require a HCR, as it cannot be prepared on a property that is still under construction. **For new homes marketed 'off plan', the Home Information Pack could include a 'freestanding' energy report based on predicted energy consumption.** The exact requirements for new homes is subject to consultation, the '*Contents of the home information pack'* consultation paper published on 31 March 2003[11], includes a draft HCR and energy efficiency assessment.

Sellers will be responsible for preparing the Home Information Pack. Most of the items in the pack are obtained at some stage under the current process, although responsibility for obtaining local searches and the HCR will transfer from the buyer to seller. Illustrative costs of providing and validating pre-contract information for a typical freehold sale are given in the '*Contents of the home information pack'* consultation paper, this estimates the cost of the pack to be £665.

The cost of the HCR will be determined by market forces, and will reflect a number of factors including the time taken to complete the report and local market conditions. It is estimated that the HCR (including energy report) will cost £250-£300 for a typical 1930s three bed semi-detached house in a provincial town.

The EU Energy Performance of Buildings Directive (EU 2002/91/EC) which came into effect January 2003 will also have an effect on the environmental performance of our buildings and how this performance is communicated. Article 7 requires Member States to ensure that, when buildings are constructed, sold or rented out, an energy performance certificate is made available to the owner or by the owner to the prospective buyer or tenant. The Directive allows three years for implementation, and a possible further three years for full application of some provisions, including those on energy performance certificates.

7.3 Sales of existing homes

Compared to other consumer product markets, the homes sector is unusual due to the fundamental role of the second-hand market. Less than 10% of home sales last year were new dwellings. The housing sector is slow paced in comparison to the automotive and white goods sectors for example, with 'churn' in the housing stock in the UK resulting from new house completions, at a rate of less than 1% per annum.

[10] Many new homes in the UK are sold 'off plan'. This primarily results from the demand for new homes exceeding current supply rates. A home purchased 'off plan' is sold based on the marketing information and drawings alone before the building process has finished, or even begun in many cases!
[11] www.housing.odpm.gov.uk/information/consult/infopack/contents/index.htm

It is important to note that EcoHomes, unlike the NHER scheme, is specifically aimed at the new homes sector and cannot be used (in its current format) to assess existing homes unless refurbishment is occurring. BRE are currently proposing to develop a scheme for assessing existing homes, this would be developed for housing associations to assess existing stocks rather than individual homes. As established previously, improving the sustainability of the existing housing stock in this country is critical in meeting the target of achieving a 60% cut in CO_2 emissions by 2050, because of the rate at which the built fabric is replaced.

The importance of including existing homes in any scheme to improve the sustainability of the average UK home is key from two perspectives; the market size compared to that for new homes, and the importance of tackling the sustainability of existing stock for environmental reasons.

Any proposed sustainability label should stay with the home as it is sold and resold in the future. It is expected that the form of a home and the information upon which the assessment is based may change throughout the life of a dwelling (e.g. heating supply changed and insulation added), which may be over 60 years. **Homes may need to be re-assessed each time they change owners as part of the Home Information Pack and become an 'MOT' for homes.** This mechanism would hopefully encourage homeowners to take a holistic and long-term view on the sustainability of their home, in relation to running costs and the future 'saleability'.

7.4 National Government Legislation/incentives

Stamp duty is essentially a charge on certain documents, not transactions. Conveyance or transfer on sale of certain assets including land, exchanges or partitions of land and lease premiums attracts payment of stamp duty. Rates from 28 March 2000 are:

- Up to £60,000 nil
- £60,001 to £250,000 1%
- £250,001 to £500,000 3%
- More than £500,000 4%

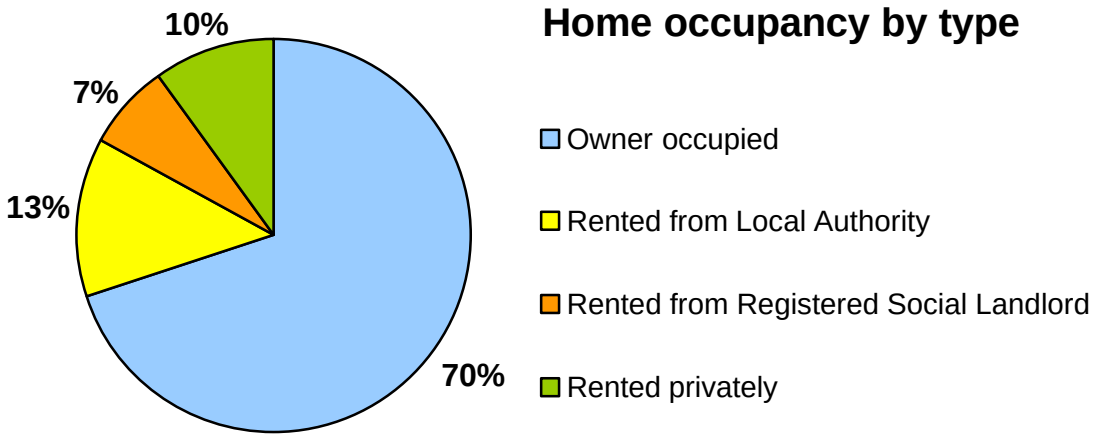
Property transfers in disadvantaged areas up to £150,000 are currently exempt from stamp duty.

The possibilities of offering discounted stamp duty rates could be considered for more sustainable homes. This would be a long-term proposal following the introduction of an eco-label into the sector. Stamp duty relief could potentially offer the government a strategy for improving sustainability in the existing homes market. Consumers would be financially encouraged to buy sustainable homes to reduce their purchasing costs and this should result in vendors maximising the sustainability of their properties prior to putting them on the market.

Another potential strategy for encouraging consumers to increase demand in the homes sector for sustainable products is to address how home purchases are financed. **The majority of private homes sold in the UK are purchased with the assistance of a mortgage and we believe that the opportunity exists to promote discounted mortgages for the purchase of sustainable homes.** A few mortgage lenders in the UK (including the Ecology Building Society) already offer mortgages aimed at homes which give an ecological payback, but the sector is much more developed in mainland Europe. The availability of the energy report (with SAP assessment) or sustainability assessment in the Home Information Pack could make it easier for more lenders to offer this kind of product in the future. It is proposed that further investigation into the possibilities of promoting home sustainability through mortgage lenders should be completed.

8 Privately rented properties

Of the 21.3 million dwellings recorded in the England in 2001, 70% were owner-occupied with the remainder being occupied by tenants, one-third of which rent privately. It is therefore important that a sustainability rating for (new and existing) homes is applicable to dwellings which are not occupied by their owners. We anticipate that the responsibility for ensuring the sustainability of a particular home would fall to the landlord, although the detail of such a system would require further research.



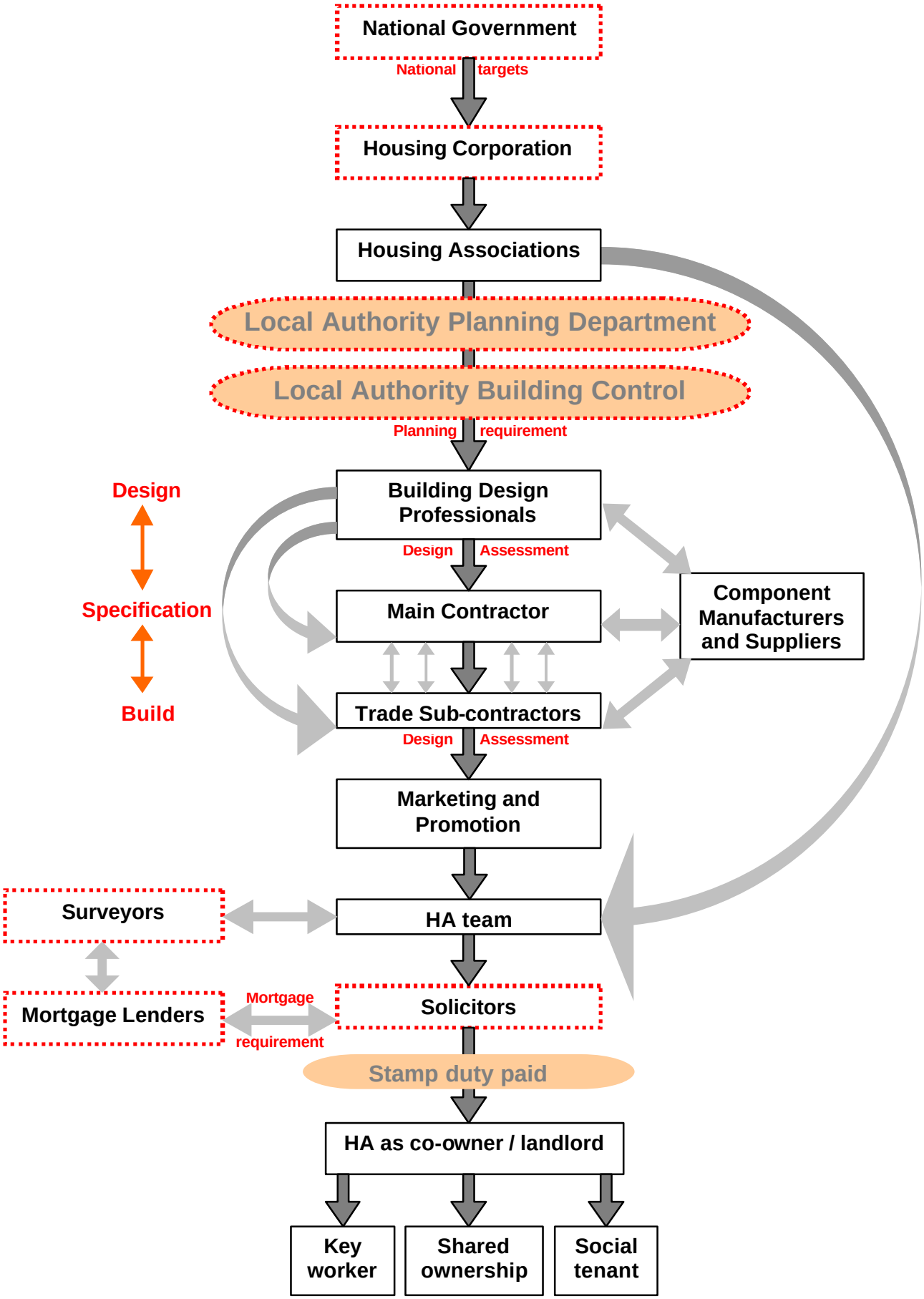
8.1 Leasehold properties

A cautious estimate for the number of leasehold dwellings in the England and Wales is approximately 2 million (1.25M flats and 0.75M houses)[12]. This figure includes the majority of purpose-built flats and many domestic conversions which are owned on leasehold rather than freehold basis. Under the terms of a long term lease, it is unlikely that a leaseholder would be able to make material changes to the fabric of the dwelling, and may have to seek the permission of the freeholder before changing the windows or heating system for example. **The scope of any future sustainability rating for homes would need to consider how sustainability could be fairly measured in leasehold homes, and ensure that such properties were not disadvantaged in the open market for having less potential to be 'up-graded' by the leaseholder.**

It is proposed that further research into this issue should be completed. **It may be concluded from this that freeholders could become responsible for ensuring that their leasehold properties meet certain sustainability standards. Potentially, when granting a new lease or tenancy agreement, an EcoHomes assessment could by required every 5 years.** Methods of promoting and monitoring reducing the environmental impact of homes which are not owner-occupied require further research.

[12] Source: LEASE – The Leasehold Advisory Service

9 The 'social new homes' market



9.1 The Social Sector

Housing associations (HA) are the main providers of new social housing in England. The Housing Corporation is responsible for investing public money in HA and for protecting that investment and ensuring it provides decent homes and services for residents. The Corporation invests in HA to provide homes that meet local needs, and through regulation they seek to ensure that people will want and be able to live in these homes, now and in the future.

The Housing Corporation invests in and regulates a sector that owns and manages more than 1.45 million homes (approximately 7% of English housing stock). If investment levels are maintained and the transfer of former local authority stock continues, housing associations will own and manage around 4 million homes in 10 years time. In their Approved Development Programme (ADP), the Housing Corporation plan to invest approximately £3 billion over the next three years to allow associations to provide around 85,000 new homes.

On the diagram above, the red dashed-line boxes and red text indicate possible links in the chain where we believe a sustainability rating for homes could be promoted and/or assessed. They can be characterised as the following:

- **National Government legislation**
- **Local Authority assessment via Planning policy and/or Building Control**
- **At point of sale – for 'key worker' and 'part rent part buy' properties**
- **Housing Corporation**

The first three points are covered above in the section discussing the sustainability of the private homes sector and reference should be made to these sections. The fourth – via the Housing Corporation – is discussed below.

9.2 Housing Corporation

As part of their strategy to facilitate the provision of sustainable homes, the Housing Corporation set a target in their Corporate Strategy document of 50% of new-build ADP funded schemes to achieve a 'good' EcoHomes rating by April 2003. Following consultation it has been agreed that from 1 April 2003 all new ADP funded schemes will have to receive an EcoHomes accreditation or will not be funded. It is accepted that not all HA will be geared to achieve a 'Good' rating in 2003/4 and hence a phased approach of implementing improved EcoHomes ratings is proposed.

- For 2003/4 the minimum requirement in Scheme Development Standards (SDS) will be for an EcoHomes 'Pass' rating. Achieving a 'Good' rating will remain a recommended item in the SDS.
- For 2005/6 The Housing Corporation intend to make the achievement of a 'good' rating a minimum requirement in the SDS with 'Very Good' becoming recommended

10 The Self-build Sector

A growing number of people are commissioning (and sometimes building) their own homes. With an increasing number of media sources promoting the self-build concept, significant rises are estimated in the volume and value of the market, which is predicted to reach an estimated £5.25 billion in 2005. The boost to the self-build market is also fuelled by an ever-increasing proportion of the population who desire a better quality home than they could afford on the open market, this is particularly an issue currently given the rapid rise in house prices in the last 3 years.

In European countries, the self-build sector can represent as much as 60% of all new houses built. In the UK this figure is around 13% with the overall self-build market in the UK valued at around £4.03 billion in 2002. Within the self-build industry there are two broad segments - private self-builders and social self-builders. Social self-builders are often part of a Registered Social Landlord, these accounts for around 2% of the market[13].

It is envisaged that the situation for new self-build homes could be controlled via planning and building control in the same way as private developer built homes. Equally, when self-build homes are resold, assessment could be completed as part of the Home Information Pack which would be applicable to all homes. **It is believed that the self-build sector may reveal important consumer choice issues, self-builders are typically more involved (financially and emotionally) in the design and build process. Research into their choices regarding energy efficiency and sustainability, and opinions on the role of an eco-label for homes could be undertaken.** The impact of a sustainability label in encouraging self-builders to build sustainable homes in this growing sector is an important issue and demands further study.

11 Key stakeholders in the homes sector

An important part of ensuring the success of any market-wide initiative or scheme will be to endeavour to make sure that the methodology is understood and accepted by all parties involved in the housing market. To facilitate this, it is important to understand some of the roles, responsibilities and attitudes fostered by the key stakeholders in the homes sector.

BioRegional have undertaken some outline market research as part of this study involving consultation with representatives of the key stakeholders identified. Rather than being any attempt at rigorous market research, our enquiries have been to gain an initial overall impression which can be used to test in outline our outline hypothesis and steer future work. The findings of our research are referred to throughout this study. The key groups identified were the following;

- Environmental organisations
- Architects
- Local Authority Planning Departments
- Private Developers
- Estate Agents
- Surveyors
- Housing associations
- Contractors and Component Suppliers

Several representatives from each group were approached and questioned about their own and their client's attitudes towards sustainability, opinions on the development and implementation of an 'A-G' style eco-label for homes, and their knowledge of the BRE EcoHomes label. Their responses are referred to throughout this study and a directory of stakeholders contacted is included as an appendix to this document.

11.1 Environmental Organisations

International environmental organisations can potentially have a significant role in promoting sustainable living as part of their remit to safeguard the future of our planet. Such organisations can exert their influence through lobbying governments and commercial companies, as well as influencing consumers through endorsement and association. Several well-known environmental

[13] www.amaresearch.co.uk

organisations including WWF, Friends of the Earth, CPRE and RSPB are involved in the promotion of sustainable living, their focus is primarily on reducing resource and land use, promoting energy efficiency and renewable energy sources. Only WWF have developed their policies and initiatives on sustainable living to include actively promoting buildings and homes which minimise environmental damage. WWF-UK have been consulted as part of this study.

The experiences of WWF and partners in developing and implementing the successful FSC label for timber (which is discussed in more detail later in this document) have indicated that securing the support of influential environmental organisations can be critical in ensuring the success of environmental initiatives and the aims of developing a market transformation.

After lengthy and considered consultation, WWF have decided to support BRE EcoHomes as an indicator of sustainability under their *One Million Sustainable Homes* initiative. The initiative calls for the UK government to commit to a sustainable future for the country through the performance of our homes and commitment to policy directions set out in the recent *Sustainable Communities Plan* and the *Energy White Paper*. WWF are calling for the setting of minimum construction standards, with all new and refurbished homes in the Thames Gateway and other major regeneration and development areas meeting a minimum of EcoHomes 'Very Good', with a high proportion achieving 'Excellent'.

WWF want to see the planning system reformed to ensure that sustainability lies at the heart of all planning decisions, and that clear guidance is provided in favour of sustainable developments meeting EcoHomes 'Very Good' or 'Excellent'. Furthermore, WWF state that a fundamental review of the building regulations should occur to ensure that they deliver the Government's targets in relation to energy efficiency/fuel poverty, use of sustainable energy, reducing waste and pollution, and promoting responsible use of natural resources such as timber and water.

WWF support the aims of this study and are in agreement with BioRegional in believing that a sustainability rating for homes could have a potentially powerful role in ensuring the sustainability of homes in the future. A rating label would offer a 'common language' to all parties in the homes supply chain, an understandable and quantifiable definition and measure of a sustainable home. The EcoHomes scheme, or a development of it, would also be uniquely placed in the sector because its scope covers both the *'where?'*(planning regulations) and '*what?'* (building regulations) of house-building.

WWF initiated an independently facilitated stakeholder dialogue as part of their *One Million Sustainable Homes* campaign. This included a consultation questionnaire sent to around 350 stakeholder representatives including Government, Local Authorities, planners, architects, house builders, consumer organisations, and non governmental organisations (NGOs). They also had a series of one to one meetings with Government, industry and other NGOs, and held a key stakeholder workshop. WWF's findings broadly concurred with the small-scale consultation completed as part of this study. Respondents generally indicated their concern of environmental matters and sustainability, and support of initiatives to encourage sustainable homes.

11.2 Stakeholder views on the planning system

Initial questioning of stakeholders indicates that private developers believe planning authorities are increasingly requiring more sustainable solutions, but there is some concern that lack of awareness is resulting in confused and contradictory planning briefs. **Private developers indicate that they would support a simple sustainability label and stated that they felt it would help them deliver sustainability within a planning brief.** This conclusion was generally supported by the architects consulted who had varying views on whether local authorities were

requiring more sustainable solutions and equally whether a homes label would help them meet planning briefs. Familiarity with EcoHomes in this group was fairly good.

Representatives from local authority planning departments indicated their interest in promoting both energy efficiency and sustainability, although their primary focus is on energy/fuel poverty, transport, waste, air quality, ecology and decontamination issues. Individual authorities had varying policies and strategies in place regarding sustainability from overall action plans to specific desires to see eco-footprinting methodology being used to assess sustainability.

There was general support for energy efficiency and/or sustainability labels, although this was tempered with concerns over implementation, training and the legal implications of authorities adopting a particular label. **The group expressed concerns that specifying a particular label in a planning brief may be legally challenged and deemed too restrictive. One authority indicated a label would have 'no weight' if it was not part of the planning system, another stated their wish to see the legal issues resolved through regional government policy.**

11.3 The private sector

From the consultation, it appears private developers are aware of increased customer concern over energy efficiency and environmental issues (although the majority are more aware of ecology than materials issues). This interest appears to be driven though consumer desire to reduce the running costs of their homes. **Private developers report that their shareholders and investors are beginning to ask for more sustainable housing solutions.**

There was some indication that developers thought consumers would be interested in sustainability labels although more market awareness of the issues is required. One respondent felt that clients were already 'subconsciously' interested in sustainability as they are concerned about the location of their homes and distance to local amenities and public transport links. Developers also thought that consumers are more interested in lifestyle issues and running costs than the 'technical issues' involved in building a house.

11.4 Estate Agents and Surveyors

As part of the stakeholder consultation, some estate agents were contacted for their opinions. In their view homebuyers are currently not interested in energy efficiency or sustainability issues when buying a previously-owned home. At the lower end of the market, there is some interest in heating systems and running costs, but otherwise agents consider that consumers are primarily concerned with the visual aspects of the property. There is a view that the only way consumers will become interested is if a sustainable home will save them money. Opinion varied on the potential of a sustainability label, although most respondents thought a label would not help them sell homes in the current market, they felt that this may change in 5-10 years time with increased public awareness. None of the respondents were aware of the BRE EcoHomes scheme.

Surveyors were also consulted for their comments on the scope for a sustainability label for homes. In agreement with other consultants to the homes sector, surveyors indicated they believed their clients (homebuying consumers) were interested in energy efficiency and sustainability, but that this was limited to concerns over running costs, transport and health and wellbeing. This appears to conflict with the views of Estate Agents, who felt that their clients (the same homebuying consumers) were not very interested in energy efficiency or sustainability. The concept of sustainability labels was generally supported by surveyors, but concerns were raised about the need for government enforcement to ensure compliance. One surveyor feared the label would be impractical and expensive for assessing existing homes. The surveyor felt that

housebuilders were struggling to meet revised Building Regulations and that the introduction of a sustainability label would be problematic for the sector generally. Another surveyor indicated that they would personally not be interested undertaking further training to enable them to do an EcoHomes survey as part of the mortgage survey because mortgage surveys do not pay well.

11.5 The social sector

The stakeholder consultation of housing associations indicated that their organisations and their tenants were interested in energy efficiency issues. This primarily originates from a desire by all parties to reduce running costs and tackle fuel poverty. The demand for energy labels was less clear. One association stated they would rather invest in addressing energy efficiency directly than a label which promoted it. There was also varying interest in sustainability issues and the potential for a sustainability label. Although most associations expressed their interest, it was suggested that with current acute affordable housing shortage, home sustainability issues were of minor importance to tenants. However, one association expressed their policy of actively encouraging sustainable living to their tenants by offering initiatives such as composting schemes and funding research into construction material impacts and carbon budgeting.

Housing associations appear to experience widely varying sustainability demands from local authorities via planning briefs. BRE EcoHomes was widely known amongst the stakeholder group, with one respondent stating that their association recommended a score of 'good' for their developments. There was general support for a sustainability label providing there was no conflict with EcoHomes which is the standard being promoted by the Housing Corporation.

11.6 Contractors and component suppliers

The contractors questioned were familiar with the EcoHomes label and are finding that both clients and local authorities are increasingly interested in energy efficiency and sustainability. Private and social clients are keen to explore the possibilities of expediting the planning process through offering sustainable solutions.

The component suppliers are an important link in the homes supply chain and therefore critical to ensuring that new and refurbished homes can be sustainable and built economically using materials with low environmental impact. The suppliers consulted indicated that their clients are increasingly concerned about sustainability and the environmental impact of materials and components. **Suppliers stated they would be willing to promote their products as helping meet the criteria of a sustainability label. Developing a link between building products and the performance of the homes they become incorporated into is potentially very powerful for both the new and existing homes sectors**. For Housebuilders, the label would enable them to specify and bulk order sustainable products to assist them in meeting sustainable targets which may form part of their planning briefs. For people who are refurbishing homes, labelled products which can be linked to improving the sustainability performance of their homes should increase consumer choice and over time facilitate an improvement in average product performance whilst incrementally improving the performance of the existing housing stock.

11.7 Summary of stakeholder responses

Generally, the level of awareness of energy efficiency and sustainability issues was found to be high amongst the group. **The overall consensus was that home buying consumers are currently moderately interested in energy efficiency and sustainability in relation to their homes, but that levels of awareness and interest are growing.**

It was also confirmed that local authorities and housing associations are increasingly seeking sustainable solutions for new developments and that a sustainability label may help provide a 'common language' for all links in the homes supply chain to help define and meet planning briefs.

Opinion on the potential of a sustainability rating in the homes sector is very encouraging, although there are some concerns about the complexity of a label and the legal implications of specifying a particular label. Awareness of EcoHomes in the sector is quite high, the group's responses indicated that clarification would be required on how the new label would 'mesh' with EcoHomes and existing legislation.

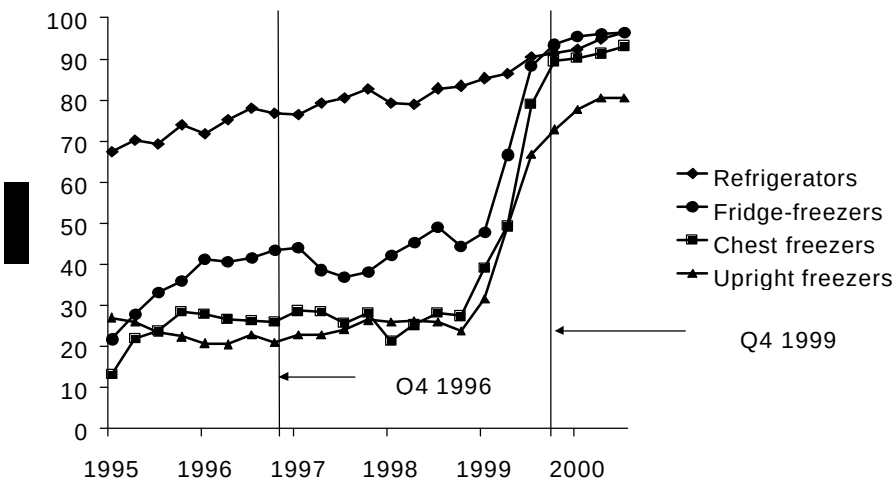
12 Eco- labels and rating schemes for other consumer products

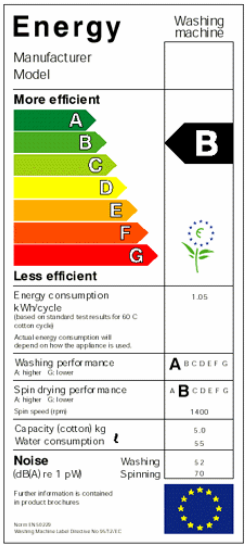
This section of the report aims to identify the possible implications and issues arising from introducing an 'A-G'-style eco-rating scheme for homes. More specifically it discusses current energy and eco-labels which have been introduced for other consumer products, and considers the relative successes and the lessons to be learnt when applying the principles to the homes sector. In particular the EU Energy label, the EU eco-label, the proposed A-G label for motor vehicles and the FSC (Forest Stewardship Council) scheme for sustainable wood are discussed.

12.1 White goods and EU Energy Labelling

European Directive 92/75 EEC on Energy Labelling of Household Appliances, brought into force in the UK the first labelling directive making energy labels mandatory for household refrigeration appliances on the open EU market. The scores indicated on the Labels range from 'A' for the most energy efficient to 'G' for the least efficient, the scale is linear in nature in comparison to the NHER energy rating for homes which is logarithmic. The scheme was introduced in 1995 and has subsequently been extended to cover most white goods. The EU introduced maximum permissible limits for energy consumption in refrigerators and freezers in 1999. A voluntary commitment by the industry established corresponding limits for washing machines in 1998, and from 2001 the scheme has been applied to light-bulbs.

The graph below illustrates (kindly supplied by Dr Brenda Boardman – Environmental Change Institute) the UK sales of cold appliances between 1995 and 2000, which met the minimum energy performance standard, the sharp rise in the graph coincides with when minimum standards came into force at the end of 1999.





By law, the Label must be displayed on all new domestic washing machines, tumble-dryers, combined washer-dryers, dishwashers, refrigerators, freezers and fridge-freezers. The EU Energy Label information must be provided for all methods of purchase of such products, additionally any catalogues and manufacturers' literature must contain similar information.

As well as indicating the overall A-G rating, the label should also contain information on the energy consumption, water usage, and sometimes the noise level. The European 'flower' may appear on the product's label, this indicates the appliance has been independently assessed and found to meet strict environmental criteria, putting it among the best in its class.

The EU labelling scheme enables comparison between models when choosing new domestic white goods. The figures indicated on the label represent the energy efficiency of the appliance, the build quality and reliability may differ between manufactures. The label does not represent an endorsement of the product. EU Energy labels on 'white goods' give consumers clear and easily recognisable information about the energy consumption and performance of appliances.

The labelling scheme is based on an energy efficiency index generated by comparing the individual product's performance with an average European model. The energy rating is found by dividing the annual energy consumption (kilowatts of energy used) of a piece of equipment by the space within it (its volume). This allows comparison between appliances (such as refrigerators) of different sizes and with differing proportions of cool or frozen spaces.

12.2 Energy Rating for Cars

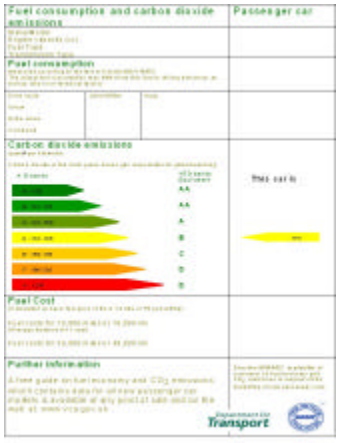
From January 2001, the implementation of EU Directive 99/94/EC has required all new cars in the UK to carry a label indicating carbon dioxide emissions per kilometre and fuel consumption associated with their use. Following this, the UK government have made new cars subject to different rates of duty depending upon which of the graduated Vehicle Excise Duty bands they fall into. Cars that produce the least pollution and have the lowest CO_2 emissions are rated as band 'A'; as cars become less efficient the band rises to 'D'.

The Department for Transport has planned (for summer 2003) pilots of comparative labels based on the CO_2 emission bands used on the graduated Vehicle Excise Duty scheme with information presented in the style of the EU Energy label. As part of the study, market research will be undertaken to gather, analyse and report the popularity and successes of the pilot. Under the proposed scheme, car buyers will be able to compare the environmental credentials of cars in a similar way as EU Energy labels allowing them to compare the performance of different domestic white goods. The final report is due for publication in September 2003.

12.3 EU Ecolabel

The European Union Ecolabel - called the Flower – is awarded to products which meet strict criteria to prove that they minimise their impact on the environment. It is the Europe-wide green label and is run in the UK by DEFRA.

The Label can be used by goods and services which have a lower environmental impact than similar products performing the same function. Through the setting of strict environmental criteria for product groups, the scheme enables consumers to make reliable and informed decisions, with the central principle being the empowerment of the individual through consumer choice. By making purchasing simpler for consumers who are concerned about the environment, the scheme strives to actively encourage manufacturers to design products with reduced environmental impacts.



1. Current DfT environmental information label for new cars
2. An example pilot eco-label for cars
3. EU 'flower' Ecolabel

The scheme is voluntary and there are no regulations to oblige manufacturers to apply for the label. Instead the scheme places emphasis on consumer demand to transform markets. It is assumed that where demand is high for products which minimise environmental harm, those bearing the 'Flower' will have a competitive advantage. This is important as increasingly customers are seeking goods which can prove that they meet high environmental standards.

The EU Ecolabel can apply to both goods and services (although not food, drink or pharmaceuticals). The product groups which have been included so far are:

- washing machines, dishwashers, refrigerators, light bulbs (all of which are also covered by the EU Energy Label);
- televisions, personal computers, laptops;
- tissue paper products, copying and graphic paper;
- textiles, footwear, mattresses;
- laundry detergents, dishwasher detergents, all-purpose cleaners and cleaners for sanitary facilities, hand dishwashing detergents;
- hard floor coverings, indoor paints and varnishes;
- soil improvers and growing media.
- Other product groups currently being developed include furniture and tourist accommodation, which will be first group to apply to a service sector.

The European Commission is responsible for establishing and revising the criteria for a specific product group by giving a mandate to a Board composed of Competent Bodies and a Consultation Forum consisting of all relevant interested parties (including non-governmental stakeholders, trade associations, and consumer bodies).

The product criteria must be selective, to ensure that those products that carry the EU Eco-label do have a reduced impact on the environment. They are intended to allow up to 30% of the current market share to qualify for the Eco-label.

The criteria set are usually valid for between three years and five years, after which they are revised to take into account market changes and technological advances, but criteria can be revised before the expiry date if circumstances warrant it. This ensures that the EU Eco-label remains up to date and a symbol of good environmental standards.

12.4 FSC scheme

Formed in 1993, in reaction to growing public concern about the destruction of the world's forests, the Forest Stewardship Council (FSC) aims to provide the public with reliable information about forest products. It has the support of major companies, NGOs and governments around the world. FSC is an independent, non-profit, non-governmental umbrella organisation within which qualified independent certifiers operate using clear guidelines and agreed standards with regard to forestry. It is responsible for evaluating, accrediting and monitoring certification organisations, which inspect forest operations and grant labels certifying that timber has been produced from well-managed forests. The FSC does not certify products itself.

The FSC initiative was NGO-led and originated with the formation of the 1995 Group and subsequently the WWF 95+ Group. In the beginning the scheme was met with reluctance from forest growers who viewed it as an imposition and who fought it at first. B&Q were one of the first large companies to sign up to FSC and were followed by other organisations that were keen to show their 'green' credentials. It is believed that much of the success of the FSC scheme is due to the 1995 Group, this buyers group of retailers, through commercial pressure, in effect set a market requirement for suppliers to provide FSC timber.

The FSC established 10 global principles and criteria regarding the procurement of forest products from certified well-managed forests, these global principles are then interpreted at a national level. The scheme is subject to ongoing reviews by the FSC, and targets have been set for the scheme's development (in terms of global areas of sustainable woodland), although it is believed that there are no plans to make the compliance criteria tougher over time.

The FSC use accredited auditors to ensure monitoring and compliance, whilst they retain overall management of the scheme. The forestry market has undergone considerable transformation, and now it is becoming increasingly difficult to sell non-FSC timber in the UK, it is understood that sawmills sometimes charge a premium of up to 10% for taking timber from non-FSC sources. This is primarily because of the associated segregation issues and costs. Current figures suggest that approximately 40% of forest and 60% of timber harvested in the UK is FSC certified.

12.5 Lessons learnt: Similarities and differences for the Homes sector

The energy rating of buildings across Europe has to date taken place on a national basis with individual countries introducing and supporting their own schemes. By comparison, energy labelling of appliances is subject to various European Union directives and operates on a pan-European basis with a common A-G energy labelling scale. One explanation suggested for this situation is that legislation reflects the fact that a certain appliance may be sold in several different EU countries, but a house can only ever be located in one.

Although individual homes can only exist in one location, many homes across the UK are built to house templates developed by housebuilders. The top national housebuilders hold the designs to a range of standard house types which are built again and again across the country with only minor variations.

The SAP rating procedure, which lies at the heart of both the proposed energy element of the HCR and the energy section of EcoHomes, does not consider building orientation and location as part of the calculation, hence there is no reason why standard house types cannot be awarded SAP values which would be valid wherever they were built. With the NHER scheme or a future sustainability rating, site specific data is required and each dwelling would require its own individually calculated score.

One conclusion that can be drawn from the successes of the EU Energy Label, is that for an appreciable improvement to be realised in a product sector, mandatory labelling or industry wide voluntary labelling, accompanied by other measures such as minimum standards help to guarantee success. Voluntary labelling schemes by themselves are insufficient to facilitate a market-wide step change in performance, and as illustrated by the above graph, significant sector-wide performance improvements require the introduction of minimum standards.

As mentioned earlier in this study, the majority of environmental labelling schemes are exclusive, rewarding the best (and often most innovative) products in the particular sector, whilst encouraging companies currently performing outside of the top range to improve their products.

If the energy section of the HCR in the proposed Home Information Pack was expanded in scope to comprise a sustainability assessment, this would suggest (because of the legal obligation to complete a HCR when marketing a home) that it would be inclusive in nature. EcoHomes is an exclusive assessment and if the scheme was to be developed the basis of a sustainability rating for homes, the implications of making it inclusive (and mandatory) would need to be assessed. These implications would include the following:

- Co-ordination between sustainability label and Building Regulations requirements
- Ensuring incentives for housebuilders and owners to improve the performance of their home from a low score to a higher one.
- Encouraging innovation and exemplar performance in excess of minimum requirements
- The engagement of industry to engender sector commitment
- Avoidance of a lowering of standards under industry pressure

12.6 Lessons learnt: Homes as consumer products

Although homes are classed as consumer products, **the housing sector is unique in terms of the very low 'churn' in the market due to new products, the extremely high product cost and the slow rate of innovation and product development.** At any point in time, the vast majority of people are living in homes which have been previously owned, this is particularly unusual when compared to other consumer products. **Care will need to be taken in the formulation of a sustainability rating for homes with regards to the relative scoring of new and old homes. There are potential issues with the rating scheme either encouraging the refurbishment of older homes when new ones would be better, or artificially boosting the new homes sector through 'writing off' large amounts of the existing stock.**

The question of whether it would be more sustainable to substantially increase the rate of stock replacement through demolishing many more homes is an important issue, and one which deserves further research. There are obvious social and economic implications in promoting such a strategy when the majority of poor performing housing is in the social sector in deprived and difficult areas, and/or occupied by low income residents who have limited opportunities to improve the sustainability of their homes.

12.7 Lessons learnt: Lifestyle rather than product

Environmental analysis, including eco-footprinting assessment, highlights the fact that the majority of our environmental impacts as consumers, and hence potential savings, are attributable to lifestyle decisions and not the materials used in the products themselves. None of the existing rating schemes for homes or labels for consumer products considers

how the consumer uses the product and whether their use patterns are sustainable. However, the way a product is designed can encourage a particular lifestyle or behaviour. What we are proposing for a sustainability rating for homes, attempts to try to take into account these lifestyle issues whilst still maintaining the anonymity of the occupants. Although standard occupancy patterns will have to be used for practical reasons, the rating scheme will be based on assumptions that the provision of certain facilities or home location, will encourage sustainable occupation, e.g. the specification of segregated domestic bins will be assumed to have an effect on the waste output of the household in question.

12.8 Lessons learnt: Single-issue or multi-issue label?

In 1999, The DETR commissioned a report by Ernst & Young and Atlantic Consulting[14] investigating the lessons for the UK market from existing environmental labelling schemes. One of the report's conclusions was that a single criterion approach to labelling is preferable wherever possible, given industry preference. It is understood that many labels do use a multi-criteria approach with the aim of doing justice to the complexity of environmental impacts, and to protect the schemes supporters from allegations of unfairness. The report conclusion stated that *'…a single criterion approach is preferable wherever possible, given industry preference. But a multiple criteria approach can be adopted, particularly in cases where there is a product where no one environmental impact stands out.'* **In the area of homes, because of the inherent complexities of design and performance in addition to the range of issues implied through measuring sustainability, a multi-issue label is essential for sustainability.**

13 EcoHomes as the basis for a future eco-rating label for homes

It has been established in this study, that the CO_2 emissions associated with the energy efficiency of houses is not the main contributor to the environmental impact of our lifestyles, with approximately two-thirds of the emissions attributable to our food and transport demands.

As environmental sustainability must cover the impact of our lifestyles including transport, food, water, materials consumption and waste production, we believe that a future eco-label assessment for homes must cover the wide range of issues related to achieving sustainable living. Of the existing home-rating schemes identified above, only BRE EcoHomes assesses the sustainability of dwellings beyond purely home energy efficiency.

One opportunity that exists is to replace the Energy Report section of the Home Condition Report in the proposed Home Information Pack with a more comprehensive Sustainability Report based on the BRE EcoHomes assessment method.

It is widely accepted that BRE EcoHomes is the most comprehensive and successful domestic sustainability assessment tool currently available. The Building Research Establishment tool addresses the environmental sustainability of new developments and refurbishments under seven criteria (energy, water, land use and ecology, transport, health and wellbeing, pollution, and materials) with the aim of providing an indication of the sustainability of a home. **It has been highlighted in this study that the current incarnation of EcoHomes would not be suitable for immediate use as a universal sustainability assessment tool without further development. This is primarily because the scheme is currently configured to assess only new homes and refurbishment works.**

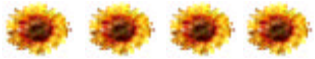
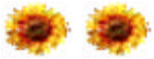
[14] Ernst & Young and Atlantic Consulting (1999), '*Environmental Labelling of Consumer Products: Lessons for the UK Market from Existing Schemes*'.

For this section of the study, the BRE have been consulted to ascertain how they envisage EcoHomes being developed in the future, and their opinions on reconfiguring EcoHomes to be used as the basis for a sustainability rating tool suitable for assessing all dwellings.

13.1 Ratings and scales

EcoHomes currently provides a rating of Pass, Good, Very Good and Excellent. The BRE are considering how to extend this range to recognise exemplar performance. Such an (Excellent +) award would be aimed at developments which already meet the 'Excellent' standard, and would either involve further assessment via a broader range of criteria, or could simply be awarded for homes meeting 85% of the credits (compared with the current 70% threshold for Excellent). The table below shows how a typical new housing development may score on EcoHomes and how the credits awarded and weighted to produce the final overall score. As can be seen below, this residential development scores 'Good'.

Section	Criteria	Available credits	Credits scored	Section	Available credits	Credits scored	% achieved	Weighting	Credits
A	CO_2 production	10	5	Energy	20	13			
B	Building envelope performance	5	5						
C	Provision of drying space	1	1						
D	Eco-labelled goods	2	0						
E	External lighting	2	2						
F	Public transport	2	1	Transport	7	1			
G	Cycle storage	1	0						
H	Local amenities	3	0						
I	Home office	1	0						
				Sub-total	27	14	52%	0.30	**15.6**
J	HCFC emissions	4	3	Pollution	7	4	57%	0.15	**8.6**
K	Low Nox emission	3	1						
L	Timber for building elements	6	4	Materials	31	21	68%	0.15	**10.2**
M	Timber for finishing elements	3	0						
N	Recyclable materials	6	6						
O	Environmental impact of materials	16	11						
P	Water consumption	5	2	Water	5	2	40%	0.10	**4.0**
Q	Ecological value of site	3	0	Land use & ecology	9	1	11%	0.15	**1.7**
R	Change of ecological value of site	4	1						
S	Building footprint	2	0						
T	Daylighting	2	1	Health & wellbeing	7	4	57%	0.15	**8.6**
U	Sound insulation	4	2						
V	Private space	1	1						
Totals		**86**			**86**				**48.7**

Current EcoHomes Score	Current EcoHomes 'Sunflower' Rating	Current EcoHomes Rating	Possible Label Rating
		Excellent +	**A++**
70		**Excellent**	**A+**
60		**Very Good**	**A**
48		**Good**	**B**
36		**Pass**	**C**
			D
			E
			F
			G

As can be seen from the above tables, the EcoHomes rating is based on a numeric score which could be related to an A-G scale quite easily. Our understanding is that the EU Energy labelling scheme is designed so that products with median performance are awarded a 'C rating'. Hence, any A-G rating for homes could follow the same principle, and an EcoHomes Pass would correspond to a C rating or above.

The width of the 'A-G' scoring bands for the sustainability rating and the likelihood of being able to 'upgrade' a home sufficiently to move it into the next band, are two important issues. With SAP ratings for example, even with quite substantial home energy efficiency improvements, homeowners are often only able to achieve small SAP rating improvements. Consequently, this indicates that movement into higher bands might be limited. The careful and considered calibration of the sustainability rating will be critical to ensuring that the band widths and scoring criteria are suitably configured to facilitate reasonable upgrading between bands. Further research on these matters is recommended.

It is not anticipated that ratings will need to be 'date stamped' (e.g. C-rated 2003) to aid consumer awareness despite the fact that the assessment criteria and scoring bands will change over time with each revision of the label. It is proposed that a new assessment will be required whenever a property is sold (as part of the Home Information Pack), whether from the new or second hand market, and hence every home on the market will be required to have a current sustainability rating awarded under the latest edition of the label. This will help keep consumer interpretation straightforward and hopefully ensure confidence in the label as all homes on the market at any one time will be scored under the same system. There may be some consumer demand in the long term for explanatory information to indicate how bands from different editions of the scheme compare to each other, i.e. is a band 'C' home in 2020 better of worse than an 'A' rated home in 2003?

The BRE highlight that introducing any changes to the rating scale would need to be considered carefully to ensure no confusion is caused within the market, and that any changes do not adversely affect the use of EcoHomes and its perception in the market.

13.2 The scope for applying EcoHomes to second-hand properties and widening its sustainability agenda

The issues assessed under EcoHomes are grouped into the seven categories, for each section the BRE were consulted to discover how they envisaged the categories being developed in the future. The seven sections are:

- Energy
- Transport
- Water
- Land Use and ecology
- Pollution
- Health and well-being
- Materials

13.2.1 Energy:

Energy is currently comprehensively covered within EcoHomes. Issues such as the use of renewable energy, community heating and energy saving measures are covered through the CO_2 emissions credits. The performance level set for all issues with the section will be reviewed over time; however there are currently no additional criteria likely to be added.

The Energy section of EcoHomes is currently one of the more complicated and lengthier to complete. There are concerns regarding the application of this section for use on second-hand buildings, due to the requirement to know the approximate construction build-up of each building element and the complexities of ascertaining this information on existing buildings. However, the proposed Energy Report of the HCR is based on producing a SAP rating for the dwelling. As the Energy section of EcoHomes is also based on a SAP calculation, the amount of work implied appears comparable.

13.2.2 Transport:

This section looks at access to public transport, the proximity to local amenities, cycle provision and provision of a home office. The BRE state that this section would be extended to cover issues such as:

- Predicting CO_2 emissions from transport
- Car clubs
- Restricting car parking provision
- Travel plans

BioRegional are encouraged by these possible extensions to this section. For assessing second hand homes the majority of these criteria are applicable.

13.2.3 Water:

The water section is a prediction of the water used within the dwelling, and is addressing the issue of water conservation. Developers provide information of the types of fittings and appliances which are installed, and the EcoHomes assessor is able to predict the water consumption. Grey water and rainwater recycling is taken into account and BRE are planning to introduce an extra credit for the use of rainwater butts, or other rainwater harvesting for garden

and landscape watering. The BRE indicate that they are not aware of any further issues which could sensibly be introduced.

The current assessment criteria for this section appear to be equally applicable to both the new and second hand homes market.

13.2.4 Land use and ecology:

This category looks at the type of land the dwellings are built on, how the ecological value may be enhanced, and a simple estimation of the change of ecological value. In addition credit is given for minimising the building footprint compared to the overall floor area.

The BRE feel that additional issues that could be included are:

- links to biodiversity action plans;
- introduction of wildlife corridors (however this will only usually be appropriate for larger developments, and therefore may be best omitted)

This section measures enhancement or loss in the ecological value of a site and hence requires a 'change' to have taken place to facilitate the assessment. **Under its current form, it is difficult to see how this section could be applied to existing homes. However, land use and ecology in relation to the built environment and our homes is of fundamental importance and should form part of a sustainability rating scheme.**

13.2.5 Pollution:

This section considers ozone depleting substances in insulation and low NOx burners/boilers. HCFCs are now banned in the EU in the production of insulation. Therefore this part of the category will be reduced in time and then omitted. The BRE indicate that to compensate for this new issues are being considered, particularly credit for the use of permeable paving. Other possible new credits include:

- Minimising light pollution
- Reducing external noise pollution

When considering how this section could be applied (in its current form) to assess existing homes, the rating of boilers for Nox emissions appears to be immediately applicable. Ascertaining if the construction materials used have Ozone Depleting Potential (ODP) is more complicated and we anticipate would prove impractical to assess.

13.2.6 Health and well being:

This section looks at issues which relate to the internal environment, and currently cover:

- daylighting
- acoustic performance
- provision of private or semi private space.

The BRE suggest that there are a few additional issues which could be included here such as:

- using paints with low VOC and VAH emissions;
- low formaldehyde emitting fixtures and fittings;
- low environmental impact flooring in kitchen and bathroom;
- information to occupiers on low emission paints and furnishings.
- Ventilation rates

Under the current format of this section, a reasonable amount of measurement and calculation is required for the daylighting criteria. We feel that this may prove impossible to implement and that for the assessment of second hand homes, this section may be distilled into a checklist.

13.2.7 Materials:

This section considers timber from well managed sources, storage provision for recyclable household waste and materials with low environmental impact (based on the BRE publication *'Green Guide to Housing Specification'*). BRE state that this section could be extended to cover:

- other parts of the building elements, not currently included;
- revised to look holistically at the building and consider the environmental impacts of the building materials;
- re-used, reclaimed and recycled materials
- local materials
- construction for demolition

We would definitely like to see acknowledgement of embodied energy of materials feature more strongly in the criteria for this section. Also, provision should be made for residential designs which specify high levels of thermal mass as part of an overall thermal strategy which delivers considerable environmental savings. This section would have to be reviewed before it could be applied to the second hand homes market, as there are complex issues arising from the necessary non-intrusive survey of existing building fabric to ascertain component build-up (material type and thickness), through again a simple checklist approach could be developed.

13.2.8 Additional Sections:

The BRE are considering the introduction of a Management section. This would include issues such as the provision of a house log book (this would be applicable through out the dwelling's life) and looking at the construction process (i.e. use of energy, materials and water, pollution issues, transport and waste) – the latter being appropriate only for new build.

Consultation has indicated that EcoHomes appears to be well-known across the stakeholder group and that it is respected for the range of criteria. Some respondents expressed concerns over the potential implications of adding further criteria to EcoHomes, in terms of added complexity. There was a general consensus that any future label would need to be simple to succeed in a sector awash with indicators.

13.3 Pros and Cons of EcoHomes

There are a number of issues in EcoHomes, where to perform well under one criterion reduces the ability to perform well in another. An example of this is *good thermal performance* and *good daylighting*. Windows have a lower thermal resistance than most wall types, so reducing the window size will increase the thermal performance of the building. However, to achieve good daylighting, larger windows are generally required. **EcoHomes is designed so that developers can build homes that find a balance between different issues, this has the aim of trying to reduce the likelihood of any of the relevant issues being taken to the negative extreme.** The BRE have identified the pros and cons of allowing such 'trade offs' between different sections as:

Pros –

- greater flexibility of the scheme;
- unlikely that any particular development will be heavily penalised for situations out of the developers control;
- perceived greater applicability, as all developments will be able to achieve some level of credits;
- easier to get developers to use it initially;
- allows for innovation in particular areas;
- doesn't overly reward developments which are good in one area only;
- prevents claims of high environmental performance where only a single issue is addressed.

Cons –

- no minimum standard of performance in particular sections;
- potential (especially at lower levels) for areas not to be addressed at all.

The BRE note that although there is the potential for issues to be ignored because developers are able to trade one section against another. In reality, this is only feasible at the lower scoring levels. Due to the weighting system, it is not practicable to ignore those issues which are deemed to be of higher relative importance, such as CO_2 emissions. By including the breakdown of the performance across each category on the certificate/label, the developer will be encouraged to address all the issues.

We believe that the current configuration of EcoHomes which allows potential 'trade-offs' between sections is, on balance, the best way to both achieve sector acceptance of the scheme and still encourage innovative solutions. We suggest that if 'Excellent+' or 'A+' ratings were to be developed, then achieving minimum scores in all of the sections should be considered as a prerequisite of developments being eligible for the highest ratings.

13.4 Methodology and cost of EcoHomes assessment

The cost of completing an EcoHomes assessment varies on the size and complexity of the proposed residential development. The BRE has not set either a recommended or fixed fee scale for use by assessors in quoting for EcoHomes assessments. However, in marketing literature, an indicative cost for a 40 unit development, with 4 different house types is given. This is based on the following formula:

£300 per site + £50 per house type + £15 per individual unit

Although BRE anticipate that EcoHomes assessments will be predominantly completed on new developments comprising several homes, this formula suggests a cost of £365 for an individual new dwelling. However, it should be noted that a fee of £200 (minimum) is payable to the BRE for each assessment completed to cover quality assurance and certification costs.

For assessing individual and existing homes, an eco-labelling scheme would need to be more straightforward and simpler to complete that the current EcoHomes scheme. The assessment would need to be designed so that it could be carried out at a cost (in terms of time and money) which the market could bear. This may be facilitated by allowing trained home surveyors to do the work as part of their other surveys relating to a property sale, this should make it cheaper compared to being completed as a standalone assessment. This would also require initial market research on what the market deems affordable, and subsequent research on what can be meaningfully achieved for that price. Issues of cost are particularly

sensitive for the existing homes market, it will be important that any rating scheme developed takes this into account in terms of overall cost (including QA costs).

We anticipate that for use on existing and individual homes, the assessment would be distilled into a checklist-style assessment document which could be completed by home surveyors. It may prove appropriate for two incarnations of the assessment procedure to be developed, a checklist for existing homes and a more rigorous assessment for new homes based more closely on the current EcoHomes post construction review.

Issues of cost will be critical to the acceptance of a sustainability rating scheme by stakeholders in the homes sector. The cost to the consumer will need to be carefully considered and it is anticipated that it will need to be proportional to the expected costs of the energy section of the proposed Home Condition Report.

13.5 Developing EcoHomes to be used to assess existing stock

The BRE has just produced proposals to develop a version of EcoHomes for assessing existing homes. This would primarily be used when housing associations are carrying our minor refurbishments. The proposal includes provision for developing a tool to allow housing associations to review their stock, and this would be appropriate to use in considering an individual house. The work would investigate which EcoHomes credits are applicable to existing homes, and what additions are required in each section. An assessment tool for assessing single homes is not being developed under that project.

13.6 When are EcoHomes assessments completed?

There are currently two stages in the home procurement process that an EcoHomes assessment can be completed, at design stage and at post construction (where a post construction review is carried out). At design stage, the advantages are that the developer/designer is able to improve their design to gain the highest practical number of credits and so build a more environmentally friendly development. The major disadvantage is that as this is at design stage there is no assurance that what is said to be built will actually be built, it is not practical at this stage of the process to ask the design team to provide detailed supporting documentation of, e.g. the materials used in constructing the dwelling.

The post construction review is a way of determining whether the proposed development on which the original assessment was completed, actually corresponds to what has been built. The review is not currently a mandatory part of the assessment and is rarely used (although English Partnerships require the completion of a post construction review for developments on their sites). The developer is required to provide evidence (via delivery notes for example) of what has been built and what materials and products were used. The post construction review is a desk-based assessment, and is not a check of construction quality.

If the sustainability rating became part of the Home Condition Report in the Home Information Pack, then for a new home the most appropriate certificate would be the Post Construction Review.

For existing homes, an assessment should be required when a house is put on the market, i.e. via the Home Information Pack. This has the advantage of allowing consumers to compare like with like ratings for both new and second hand homes.

14 Testing an Eco-label using Ecological footprinting methodology

Ecological footprinting analysis is an accounting tool that represents the environmental impacts of a process or person's lifestyle in terms of an area of land required to sustainably produce a particular natural resource or to absorb waste from consumption. It measures the area of biologically productive land that is required to meet the needs of a given product, person or population. It compares this area with the actual available area on earth and informs us whether we are living within the earth's regenerative capacity[15].

A person's ecological footprint is made up of the footprints of all of their activities, products consumed and waste produced. It includes the area of forest required to sequestrate the CO_2 emissions attributed to that person, and a share of the area taken up by infrastructure, food and timber growing and fishing. A person's energy consumption has an eco-footprint, as does their food consumption, transport, work activities and leisure activities.

Eco-footprinting informs us that it takes around 6.3 global hectares[16] of biologically productive land to support each person in the UK, whereas the actual available productive area on Earth is 2.2 global hectares per person. Hence, it can be concluded that if everyone on the planet consumed as much as the average person in the UK, we would need three planets to support us.

This analysis suggests the UK needs to reduce it's consumption of fossil fuels and virgin materials by two-thirds to be environmentally sustainable within a concept of living within a fair share of the Earth's resources. To achieve this reduction in consumption we need to develop sustainable ways of living.

A wider definition of sustainability covers more than environmental impact. It is frequently defined in terms of the 'triple bottom line' comprising social, environmental and economic sustainability. For our future developments and communities to be truly sustainable, they must address the social amenity, creating sustainable communities with spaces people want to live and work in. Developments must also offer financially sustainable solutions which are viable within a market economy. Although environmental, social and financial sustainability issues are intrinsically linked, the scope of this study (and the remit of any future sustainability label for homes discussed in this study) considers primarily environmental sustainability.

Ecological footprinting has the potential to be used as a policy tool as well as an accountancy tool. This is very powerful as it allows a government or client to analyse the environmental impact of a product, decision or policy, in addition to offering the potential for maximum eco-footprinting targets to be specified in the procurement of products.

14.1 Eco-footprinting for homes

The environmental, social and financial issues surrounding sustainable development are particularly closely interlinked in the housing sector. Ensuring access to appropriate, efficient and safe homes plays an important role in community wellbeing and regeneration, as does ensuring that such homes are affordable to build, buy and run, in addition to being designed to tackle

[15] WWF International (2000), 'Living Planet Report 2000', Avenue de Mont-Blanc, 1196 Gland, Switzerland
[16] Stockholm Environmental Institute research suggests this figure is 6.39 gha, this alternative figure has been developed using better data and increasingly improving calculation methodologies. This 6.39 gha figure is used in this eco-footprinting section of the report.

issues such as fuel poverty. Social sustainability is hard to assess on a home-by-home basis, although the proximity of community facilities could be assessed as part of an environmental sustainability label. Under BRE EcoHomes, the distance to local amenities is measured from the standpoint of reducing private car miles. **Two of the respondents from the stakeholder consultation group expressed their wish to see ecological footprinting methodology used to measure sustainability and be used as a tool to facilitate homes sector improvement.**

As a further illustration of the importance of housing in achieving our sustainable future, 70 of the 147 indicators used to measure progress towards achieving Government sustainable development objectives in their National Strategy for Sustainable Development, can be linked to housing and community issues.

BioRegional have developed data-sets for 5 lifestyle scenarios with the purpose of comparing the sustainability of different ways of living suggested from the occupation of different homes. The scenarios were developed to reflect a range of dwellings from a UK stock house occupied by a 'typical' UK resident with average consumption patterns and energy demands, to an enthusiastic sustainability-minded resident at Beddington Zero Energy Development.

14.2 Beddington Zero (fossil) Energy Development

BioRegional have recently been involved in the design and construction of an urban eco-village in South London, Beddington Zero (fossil) Energy Development - BedZED, designed with architect Bill Dunster and developed in partnership with the Peabody Trust. The development shows how green living is a real, attractive and affordable option. This is enabled by integrating energy efficiency, renewable energy and water harvesting with services like car pools and local organic food deliveries.

BedZED is made up of 82 homes, office space and live-work units, it is the UK's largest eco-village. The village has a mix of social housing for people on low incomes and private homes for sale at prices comparable to more conventional homes in the area. It is designed for a comfortable and highly resource-efficient way of life.

BedZED was designed to push the boundaries of 'best practice' regarding environmental performance, and is widely acknowledged as a pioneering development which sets new standards in sustainability. It was not designed to meet the requirements of any particular eco-label or environmental scheme, but to achieve net carbon neutrality and to create the opportunity for residents to buy into a sustainable lifestyle. The development has been assessed under EcoHomes and although it scored 'Excellent', we believe it highlighted possible areas of improvement for the assessment procedure.

14.3 Ecological footprinting analysis

The environmental impact of each scenario is sub-divided into 9 issues; Energy use in the home, transport, infrastructure, waste, water, land-use and ecology, health and wellbeing, food and consumer items. The Stockholm Environment Institute (SEI) have subsequently calculated the associated ecological footprints for each of the lifestyle issues for each lifestyle scenario.

Scenario 1 Typical UK resident in typical UK stock home
Scenario 2 Typical UK resident in typical new UK home to 2002 Building Regulations
Scenario 3 Typical UK resident in typical new UK home to EcoHomes 'Excellent'
Scenario 4 Typical UK resident in new BedZED home
Scenario 5 Keen UK resident in new BedZED home

14.4 Data-set indicating different lifestyle scenarios suggested by different homes

ISSUE	EcoHomes Section	EcoHomes Credit	**Scenario 1** Typical UK resident in typical UK stock home	**Scenario 2** Typical UK resident in typical new UK home to 2002 Building Regs.	**Scenario 3** Typical UK resident in new UK home to EcoHomes 'Excellent'	**Scenario 4** Typical UK resident in new BedZED home	**Scenario 5** Keen UK resident in new BedZED home
Energy use in the home	Energy	A	Average UK energy demand Average UK insulation levels 'C'-rated white goods Old boiler	Low UK energy demand UK new insulation levels 'C'-rated white goods Non-condensing boiler	Lower UK energy demand UK better insulation levels 'A'-rated white goods Condensing boiler.	V. low UK energy demand Super-insulation 'A'-rated white goods On-site waste wood CHP plant. BDG monitored data	Ultra low energy demand through lifestyle choices BDG monitored data
		B					
		C					
		D					
		E					
Transport	Transport	F	Average UK travel pattern No home office	Average UK travel pattern No home office	Lower private car use Home office	50% less private fossil fuel miles via car club Home office & local employment	Majority of journeys by foot/cycle Home office & local employment No air travel
		G					
		H					
		I					
Infra-structure	Pollution	J	Typical UK home construction	Typical UK new home construction, but with more insulation and double-glazing	Typical UK home construction, but with even more insulation. Timber windows instead of uPVC used	Similar embodied energy to typical UK new home construction, but with super-insulation, inert materials, triple-glazing and high thermal mass. Many reclaimed, recycled and locally-sourced materials used. BDG monitored data	As Scenario 4
		K					
	Materials	L					
		M					
		O					
Waste		N	Average UK waste production	Average UK waste production	Average UK waste production, but with higher recycling levels	Less waste than UK average and majority recycled	Very low waste
Water	Water	P	Average UK water consumption	Average UK water consumption	Low water consumption	V. low water consumption. On-site grey water processing. BDG monitored data	As Scenario 4
Land use & Ecology	Land use & Ecology	Q	No direct associated ecological footprint. Discussion on possible footprint implications only				
		R					
		S					
Health & Wellbeing	Health & Wellbeing	T	No direct associated ecological footprint. Discussion on possible footprint implications only				
		U					
		V					
Food	Issue not addressed under EcoHomes		Average UK consumption	Average UK consumption	Average UK consumption	Promotion of local and organic food. Slightly reduced meat eating and less packaging	Vegetarian lifestyle with majority of diet being local and organic food
Consumer items	Issue not addressed under EcoHomes		Average UK consumption	Average UK consumption	Average UK consumption	Promotion of reclaimed and recycled goods. Slightly reduced packaging levels	lower consumption of consumer goods

The Stockholm Environment Institute is an independent, international research institute specialising in sustainable development and environment issues. It works at local, national, regional and global policy levels. The SEI research programmes aim to clarify the requirements, strategies and policies for a transition to sustainability.

14.5 Ecological footprint associated with identified lifestyle scenarios

		Scenario 1 Typical UK resident in typical UK stock home	Scenario 2 Typical UK resident in typical new UK home to 2002 Building Regs.	Scenario 3 Typical UK resident in new UK home to EcoHomes 'Excellent'	Scenario 4 Typical UK resident in new BedZED home	Scenario 5 Keen UK resident in new BedZED home
Energy use in the home	A B C D E	**0.607**	**0.340**	**0.229**	**0.098**	**0.059**
Transport	F G H I	**0.564** inc. air travel	**0.564** inc. air travel	**0.524** inc. air travel	**0.360** inc. air travel	**0.168** excl. air travel
Infra-structure	J K L	**0.113** (houses)	**0.116** (houses)	**0.114** (houses)	**0.064** (houses)	**0.064** (houses)
	M O	**0.932** (rest)	**0.932** (rest)	**0.932** (rest)	**0.932** (rest)	**0.932** (rest)
Waste	N	**0.575**	**0.575**	**0.564**	**0.472**	**0.336**
Water	P	**0.006**	**0.006**	**0.003**	**0.003**	**0.002**
Land use & Ecology	Q R S	**0.324**	**0.324**	**0.324**	**0.292**	**0.292**
Health & Wellbeing	T U V	*See note	*See note	*See note	*See note	*See note
Food		**1.486**	**1.486**	**1.486**	**1.389**	**1.096**
Consumer items		**0.783**	**0.783**	**0.783**	**0.783**	**0.627**
Total Ecological footprints		**5.39**	**5.13**	**4.96**	**4.39**	**3.58**

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Energy use in the home	**0.607**	**% improvement over UK typical - Scenario 1**			
		44%	**62%**	**84%**	**90%**
Transport	**0.564**	**0%**	**7%**	**36%**	**71%**
Infra-structure	**0.113**	**+3%**	**+1%**	**43%**	**43%**
	0.932	**0%**	**0%**	**0%**	**0%**
Waste	**0.575**	**0%**	**2%**	**18%**	**42%**
Water	**0.006**	**11%**	**45%**	**52%**	**69%**
Land use & Ecology	**0.324**	**0%**	**0%**	**10%**	**10%**
Food	**1.486**	**0%**	**0%**	**6%**	**26%**
Consumer items	**0.783**	**0%**	**0%**	**0%**	**20%**
Total Ecological footprints	**5.39**	**5% saving**	**8% saving**	**18% saving**	**33% saving**

***SEI have interpreted the *Health and Wellbeing* section as representing the environmental impact of our shared services as individuals, e.g. health, education, leisure, communication and finance etc. This is demonstrably a complex section to calculate an associated EF for and SEI are currently developing a methodology for calculating this element and possible savings through lifestyle choices as part of major research project. For the purposes of this study a value of approximately 1 global hectare (gha) has been assumed for all of the scenarios.

More comprehensive ecological footprinting data associated with each element of the lifestyles for each scenario are included within the Stockholm Environment Institute's report included as an appendix to this study.

14.6 Energy use in the home

The CO_2 emissions resulting from energy use in our homes accounts for approximately one-third of UK total CO_2 emissions. For the data-sets covering the 5 lifestyle scenarios, we have made informed decisions about their associated energy demands. Domestic insulation levels have been slowly improving in homes over the years, a dwelling built to current Building Regulations is considerably better insulated, with reduced heat loss through walls, roof and floors, and better performing windows. EcoHomes rewards developments which deliver thermal performance in excess of Building Regulation minimum requirements, as well as acknowledging the specification of energy efficient white goods and boilers, these have been taken into account in the data-set.

BedZED is super-insulated, with approximately 3 times the typical insulation thicknesses for UK new build and boasts large amounts of thermal to maximise heat storage. A-rated appliances are fitted throughout and the homes are triple-glazed. Energy is provided by an on-site combined heat and power plant (CHP) which runs on chipped tree-surgery waste, this delivers both electricity and hot water for heating. Many of the dwellings at BedZED are being monitored for their energy use, the ecological footprints are based on monitored data from BedZED for average energy demand (scenario 4) and mean of best three performing homes (scenario 5).

The ecological footprint savings for this section are the highest achieved in this study, the figures illustrate that the resident's eco-footprint attributable to energy use in the home can be 80-90% lower if they are living in a ZED-type home.

14.7 Transport

The data-sets for scenarios 1 and 2 are taken from UK average travel data compiled by the Government. EcoHomes awards credits for building developments with safe and convenient access to local amenities and public transport. The provision of home office space is also acknowledged as a means of reducing commuting needs and associated environmental impact.

At BedZED a green travel plan was formulated at an early stage and formed an integral part of the design methodology. A target was set to reduce the amount of private fossil fuel miles travelled at the development by 50%. This has been primarily addressed through the inclusion of a car club, locating the development close to good public transport links and providing home-working facilities, commercial space and secure bicycle storage.

For the keen resident (scenario 5), we have assumed that the live and work at BedZED, make the most of local amenities and cycle or walk for most of their journeys. They also choose to holiday without necessitating air travel. The ecological footprinting figures for this section illustrate that a saving of approximately 50% can be made through addressing sustainable transportation.

14.8 Infrastructure

The footprint associated with this section has been sub-divided into two sections: the footprint of the fabric of the home; and that of the shared infrastructure e.g. bridges, roads, schools etc.

The data-sets for scenarios 1, 2 and 3 illustrate that the ecological footprints change little, this is primarily because the design of homes has not substantially changed for over 100 years. The minor increases in insulation levels and material specification have resulted in a slight increase in EF for new homes, although this has been offset in scenario 3 because the materials specified have lower environmental impact.

At BedZED, the materials specification strategy was designed to reduce environmental impact. A policy of sourcing materials locally was developed to reduce the transportation impact of the materials, 52% of materials being sourced within a 35 mile radius. Large quantities of reclaimed and recycled materials were also specified at BedZED.

The infrastructure footprint resulting from shared infrastructure is difficult to calculate, and for the purposes of this study, is considered to be the same for each scenario. We believe that this footprint could be reduced if ZED-type developments were more widespread and more people lived bioregional lifestyles. If people travelled less car miles and imported less food, we would need fewer roads, bridges, airports and general infrastructure currently required by our unsustainable lifestyles. This area is deserving of more study and we propose that further research should be carried out into the shared infrastructure benefits of sustainable living.

14.9 Waste

The data-sets for scenarios 1, 2 and 3 are broadly the same. This is based on typical UK waste production levels, but with increased recycling rates for the EcoHomes 'Excellent' scenario because the scheme rewards the provision of segregated bins in homes. At BedZED, the waste and recycling strategy is more comprehensive and extends from segregated bins in all kitchens to external bulk bins and integration into the local authority's recycling schemes. There are also onsite composting facilities for organic kitchen waste.

14.10 Water

The ecological footprint associated with water use appears low when compared to the other lifestyle elements. This is understood to be primarily because the (re)processing of water requires low energy input per litre.

Average UK water consumption per person is assumed for scenarios 1 and 2, with scenario 3 being slightly lower to acknowledge that credit can be given under EcoHomes for reducing domestic water consumption in homes. At BedZED, there is a grey-water recycling facility which reprocesses domestic water and harvested rainwater for re-use on-site. As mentioned previously with respect to energy use, monitored consumption data has been gathered at BedZED and the values have been used to inform the water consumption for scenarios 4 and 5.

14.11 Land use and ecology

Land use has been addressed in this study as the area of land attributable to a person's home and mobility infrastructure. For the purposes of this study, it has been assumed that the average UK home (scenarios 1, 2 and 3) is 2 storeys high. The EF associated with scenarios 4 and 5 is lower because of the compact high density development form which achieves a higher than average number of homes/hectare and reduced parking levels.

The infrastructure considered under this section potentially overlaps with that considered under the *shared infrastructure* section above. Clarification of this matter and the risk of 'double counting' could be undertaken as part of any further research.

14.12 Health and wellbeing

When considering the EF associated with our lifestyles, there is one section that is used by everyone (to a varying degree), but which is difficult to calculate and too complex to consider within the limitations of this study. This is the *service* sector including retailing, hotel and catering, communications, banking and finance, insurance and recreation. Our use of health services is included under this section.

The SEI is currently working on a methodology to calculate the material flows and footprints for the *services* sector, and first estimates indicate that the EF for services is approximately 1 gha / person / year as an UK average. It can be assumed that people who consume less than average, live a healthier lifestyle and travel less will use fewer resources from the services sector. Although there would be an associated EF saving, SEI indicates that it is very difficult to calculate a *services* EF for different lifestyles and it is currently impossible to calculate any savings.

14.13 Food

It is apparent from the work completed by SEI, that the ecological footprint associated with an individual's food consumption is a considerable component of their total ecological footprint. Approximately one-third of our total CO2 emissions in the UK are attributable to the production and transportation of our food. The data-sets for scenarios 1, 2, and 3 is identical and taken from government figures on typical consumption, the current criteria under EcoHomes do not address food footprints.

At BedZED, local and organic food is actively promoted. This includes the provision of mini-allotments for residents to grow their own produce and co-ordinated bulk deliveries of local organic food. We believe that keen BedZED residents have also addressed their food consumption more broadly, by choosing to eat little or no meat and minimise the amount of air-freighted food eaten. Local produce often has less packaging because it needs less protection from being damaged during transportation This also contributes towards footprint reduction.

14.14 Consumer items

The environmental impact of our consumption and disposal of material goods is a considerable contributor to our ecological footprints. At BedZED, an ethos of repairing, reclaiming and recycling goods is adopted by some residents, a keen resident could reduce their footprint further by reducing their consumption of luxury and purchasing goods with reduced packaging.

14.15 What are the Possibilities for adapting EcoHomes using Eco-footprinting for new label for homes?

Under EcoHomes, credits are awarded under each of the criteria which form the 7 issues covered. The score associated with each issue is then weighted prior to calculation of the overall score (see diagram below). These relative weightings are based on the findings of some focus group research undertaken by BRE several years ago. Representatives from key stakeholder groups in the homes and environmental sectors were consulted to ascertain a consensus of the relative importance of each issue.

BioRegional believe that a more realistic and scientific basis for any weighting of an eco-label for homes should be developed using eco-footprinting methodology. This attitude appears to be in concurrence with the Ernst & Young / Atlantic Consulting report on environmental labelling which concluded that criteria development should be *'…set clearly in the context of broader environmental policy goals, but needs to be built on a solid foundation of scientific evidence about environmental impact.'* The report further stated the importance of a solid underpinning of sound evidence about environmental impact, because without such foundations schemes are open to allegations of arbitrariness.

We believe that if the weighting strategy of EcoHomes criteria was recalibrated to reflect the ecological footprint associated with each criterion, then the order would be different. We feel that recalibrating the weightings on EcoHomes to reflect ecological footprinting analysis would facilitate a fairer representation of sustainability.

The Buildings Research Establishment has been consulted regarding the above issue and has commented that they are considering other ways of generating the weightings used in EcoHomes. One option the BRE is considering is the idea of using eco-footprinting as part of the weighting process and is discussing with BioRegional how this might be taken forward. The BRE are aware that this is not just an issue for EcoHomes and has wider implications within the tools developed by them. The BRE stated that any decisions regarding the above issues will require wider agreement with the BRE EcoHomes steering group.

Section	Criteria	Available credits	Weighted credits	EcoHomes order	Section	Weighted credits	EcoHomes order	Eco-footprint section	eco-footprinting value	Percentage of total eco-footprint	Eco-footprinting order
A	CO_2 production	10	11.2	1st	Energy	22.2	1st	Energy use in the home	**0.607**	11.3%	4th
B	Building envelope performance	5	5.6	8th							
C	Provision of drying space	1	1.1	20th							
D	Eco-labelled goods	2	2.2	15th							
E	External lighting	2	2.2	16th							
F	Public transport	2	2.2	17th	Transport	7.8	3rd	Transport	**0.564**	10.5%	6th
G	Cycle storage	1	1.1	21st							
H	Local amenities	3	3.3	11th							
I	Home office	1	1.1	22nd							
J	HCFC emissions	4	8.6	3rd	Pollution	15	2nd eq.	Infra-structure	**1.045**	19.4%	2nd
K	Low Nox emission	3	6.4	7th							
L	Timber for building elements	6	2.9	13th	Materials	15	2nd eq.				
M	Timber for finishing elements	3	1.5	19th							
N	Recyclable materials	6	2.9	14th				Waste	**0.575**	10.7%	5th
O	Environmental impact of materials	16	7.7	5th							
P	Water consumption	5	10.0	2nd	Water	10	4th	Water	**0.006**	0.1%	8th
Q	Ecological value of site	3	5.0	9th	Land use & ecology	15	2nd eq.	Land use and ecology	**0.324**	6.0%	7th
R	Change of ecological value of site	4	6.7	6th							
S	Building footprint	2	3.3	12th							
T	Daylighting	2	4.3	10th	Health & wellbeing	15	2nd eq.				
U	Sound insulation	4	8.6	4th							
V	Private space	1	2.1	18th							
								Food	**1.486**	27.5%	1st
								Consumer items	**0.783**	14.5%	3rd
Totals		**86**	**100**			**86**			**5.39**	**100%**	

15 The implementation of a future label

15.1 Management

The long-term success of any sustainability rating scheme is likely to be related to the ongoing management and quality assurance. The scheme could be managed and monitored through existing statutory channels, including local authority planning and building control, or even via a new pan-sector body comprising representatives from the key stakeholding parties involved in the design, construction and occupation of homes.

EcoHomes assessments are carried out by trained, licensed and registered assessors, who are trained and monitored by the BRE. Quality requirements are set down which the assessors must follow, and the BRE has its own system which monitors and ensures the quality and consistency

of the assessments carried out. **To promote independence, as with FSC, the home sustainability scheme should be overseen by an independent standards organisation which does not carry out assessments itself (whether this is the BRE or another organisation)**. This organisation would ensure the quality of the scheme in terms of:

- The credits
- The information provided to assessors
- The training of assessors
- The performance of assessors
- The accessibility of the scheme.

If the sustainability report does form part of the HCR in the Home Information Pack, then it is most likely that the assessments themselves will be carried out by surveyors who have undergone training to complete the assessment. These organisations would be responsible for having their own internal quality assurance systems and accredited by the standards body. Surveyors will no doubt be keen to know what additional training may be required and what the anticipated costs are associated with this, and also that the assessment is of a complexity comparable with the fee chargeable. Further research could be undertaken to pilot a scheme with a similar methodology to the government's Home Information Pack trial in Bristol mentioned earlier in this study.

15.2 Implementation, monitoring and uptake

If a sustainability rating scheme was to become mandatory, one possible way to monitor compliance for new build homes would be through an existing systems such as building control. They would not need to manage the process of getting the assessment completed, rather manage and ensure compliance. One possible option would be to use the Building Control system as the means of ensuring compliance; this would be similar to the current situation where a SAP certificate is required by Building Control as proof of Building Regulations compliance. However it is anticipated that such a scenario would require there to be a very clear understanding among building control professionals of the issues of environmental performance and sustainability. This arrangement would also only be suitable for assessing new homes.

For existing homes, the situation is more complicated as dwellings can be sold privately without the input of national or local government (apart from the completion of local searches as part of the conveyancing process). **Earlier in this study, it has been indicated that existing mechanisms could be used to facilitate the scheme; these possible solutions include;**

- **Requiring building societies to see a copy of the valid eco-rating prior to agreeing a mortgage on a property**
- **Including production of a sustainability assessment as part of the stamp duty procedure with the potential for discounted rates linked to higher home performance**
- **Ensuring a valid sustainability rating is in place could fall under the remit of solicitors as part of their conveyancing role with the assessment forming part of the Home Information Pack.**
- **Making it a requirement asked for by the land registry.**

Further research could be undertaken into the practical and legal ramifications of all of these scenarios, as we believe each has the potential to be developed further. In all of these scenarios,

the responsibility for having a scheme completed would be with the vendor, the only variable is who monitors that a valid rating certificate is in place.

15.3 Resistance

There undoubtedly will be some resistance to the introduction of a sustainability rating scheme for homes. We believe that this could be tackled in the first instance using three comparative examples:

Reference could be made to the success of labelling and performance improvement seen in the cold white goods sector. The introduction of the A-G labelling scheme and subsequent setting of minimum performance standards has seen a transformation in the market. Manufacturers have increased the performance of their products in-line with minimum standards, levels of product information for the consumer have increased as well as consumer choice, and today the best selling free-standing refrigerator, freezer and washing machine in the UK are both A-rated[17].

It is also worth drawing comparisons between the proposed sustainability label and the MOT scheme for motor vehicles. Our proposals suggest that homes would be assessed each time they change ownership, statistically this is likely to be approximately every 5 years. Homes would be sold with a new rating certificate which would give the purchaser an idea of the environmental performance of the dwelling and highlight any particular features or areas of potential improvement. The rating would be valid for a fixed period or until any major changes were made to the home. This could apply to rented property as well – a current 'MOT' would be required for a rent or lease agreement.

Thirdly, the experiences of the market transformation and label acceptance in the timber sector due to the FSC scheme can be used as a case study (the scheme is discussed in more detail earlier in this study). It is understood that the scheme originally met resistance from woodland managers and those involved in the supply of timber, primarily through fear of increased costs and lack of market. The pioneering companies who initially signed up to the scheme did so to promote their 'green' credentials to customers, over time the market has transformed so that in the UK, many bulk timber buyers are demanding FSC approved products and hence there is an estimated 10% premium for non-FSC timber purchased by sawmills.

15.4 Labelling criteria

For the proposed sustainability label, we propose that the assessment sections remain broadly as classified in EcoHomes, with the addition of *'Food'* and *'Consumer items'* because of their fundamental impact on our ecological footprints. The exact nature criteria below this, the equivalent of EcoHomes criteria A to V, requires further research. BioRegional propose that the identification of the criteria and the ongoing selection and revision to the list of criteria is undertaken by the independent management organisation referred to above.

15.5 Integration

The current format of the thermal elements of the Building Regulations has been derived from incremental changes to an historic method of assessing component performance. **We believe**

[17] Hotpoint RLA30, RZA130 and WMA40: Source Hotpoint January 2003

that to facilitate a step change in the sustainability of our homes, an eco-rating scheme should be introduced and made a component of the proposed Home Information Pack. There exists the potential for compatibility implications between any future scheme and existing legislation, this is discussed briefly below, but we recommend that a more thorough investigated should be undertaken as part of any further research.

EcoHomes is currently designed to go beyond Building Regulations, even for the lowest rating of 'Pass'. The BRE have indicated that if a sustainability assessment system such as EcoHomes was introduced into the Building Regulations, they would suggest that a minimum requirement of 'Pass' was set, with additional incentives to go further. It is our understanding that current legislation, including the Building Act 1984, does not make provision for sustainability issues and that primary legislation would be required. The process of producing primary legislation is a slow process requiring significant industry consultation, with the strong possibility to the aims being weakened and delays incurred. The Building Regulations are currently concerned with health and safety and energy. **Introducing an eco-rating scheme into Building Regulations would allow the government to use the scheme to ratchet up the developers performance, with ongoing incremental changes in the minimum requirements**. If the scheme used was (or was based on) EcoHomes then consideration will have to be given to a number fundamental issues. Such as:

- the potential impact on the income for BRE, and would the Government be prepared to buy the scheme off BRE;
- how the annual review would be managed, and the implications of an annual review process (including the costs);
- the premise that the ratings will be increased as practice improves;
- the status of EcoHomes, i.e. would the EcoHomes document become an approved document (and the implications of this are widespread) or would it would it be a more general statement in the Building Regulations.

The BRE has worked with the Building Regulation Directorate of ODPM in developing or advising on a number of the Approved Documents. Any changes in the approved documents are done through industry consultation. There are a number of recent developments which may impact on the energy part of the Building Regulations (reference should be made to the BRE report submitted as part of this study for details).

Another legislative route to introducing an environmental rating scheme and increase the sustainability of homes might through the planning system. It has been discussed earlier in this study that some local authorities are beginning to explore the potential of setting sustainability targets and even requiring EcoHomes assessments (and minimum scores) as part of planning briefs. There is a perceived barrier for local authorities in doing this, which is how such a requirement will stand up under appeal. Drawing together a robust case to demonstrate how eco-ratings can be included in planning would alleviate this.

BioRegional approached the Environmental Law Foundation (ELF) to give their opinion on whether local planning authorities can specify that proposed housing developments must meet certain minimum environmental standards, William Upton for the Chambers of Stephen Hockman QC responded.

Mr Upton noted that it is central government guidance that development plans should be drawn up in such as a way as to take environmental concerns into account (under PPG12). The more specific planning guidance on housing, PPG3, emphasises that local planning authorities *'should promote: development that is linked to public transport; mixed use development; a greener residential environment, greater emphasis on quality and design places for people; and the most*

effective use of land.' PPG3 also encourages authorities to adopt policies to promote energy efficiency in new housing where possible.

His comments concluded that "The national policies are not yet in place to support a refusal of planning permission because a housing development is not sustainable in a general sense – although there are grounds for refusing a development which, say, does not meet relevant transport, nature conservation or mixed use policies. What these policies on promotion can do is sometimes allow the planning authority to relax the normal standards, or to tip the balance in favour of development. It is in that sense that the planning authority might allow a developer to develop a site with either 50 homes built to conventional standards or 70 homes built to EcoHomes 'Excellent' standard."…"There is clearly more research that can be done, to provide justification for more stringent policies."

The BRE report that the current Planning White Paper is considering a significant change on how Planning is structured, with the move towards Local Strategic Partnerships and localised development plans. Sustainability is addressed to some degree in this White Paper, and the planning system offers significant opportunity to introduce environmental rating schemes for new build, major refurbishment or change of use. This has a number of advantages including:

- A more flexible approach can be taken, for instance the legislation/regulation might state that the planning authority needs to have an environmental assessment of the building carried out of a form similar to EcoHomes, leaving the local authority to state the performance level they require.
- It allows for the differing priorities of the regions within the UK, and does not need to be seen as Whitehall imposing their will.
- Different levels of performance can be specified by the Local Authority for different types of development, e.g. infill sites compared with urban extensions etc.

15.6 Updating and governance

To ensure that the rating scheme continues to keep abreast of best practice and reflect realistic targets whilst encouraging innovation, it will be important to develop a management strategy which includes ongoing review and regular updates. It is recommended that such review and revision may need the input of key stakeholders in the housing sector and require a clear and transparent methodology to ensure the scheme remains understandable and relevant to the consumer.

One strategy which could be employed to both encourage innovative sustainability solutions and make the process of updating the scheme more straightforward, would be to base the scheme on performance targets, rather than stating specific solutions to use. Performance targets such as designing to reduce water demand to *x* litres/person/annum, instead of awarding specific credits for low-flush toilets or low flush appliances, allows for incremental target increases in subsequent revisions of the scheme and further reduces the chance of prescriptively requiring a technology which may prove unfeasible.

Keeping any performance label up to date is vitally important in a rapidly changing market. The BRE works hard to ensure that this happens with EcoHomes, while maintaining market acceptability. This is ongoing research is funded by the annual assessor licenses and fees.

EcoHomes is reviewed annually (and updated as required) to allow for changes in the Building Regulations, technological improvements and the general raising of standards. As part of the annual review the level required for each of the scoring bands is reviewed to ensure they remain pertinent to the market. The BRE regularly liaises with assessors and other stakeholders to

understand their views, interests and concerns, and uses their responses to formulate an initial set of revision proposals. Once this list has been drawn up, BRE then presents it to the assessor group and steering group[18].

The primary reasons for discussion with the assessors are:

- To discuss practicality of assessing the credits;
- To get their feedback on how they think their clients will react to the clients
- To demonstrate the reasons for any change.

The intention of liaising with the steering group is to gather a cross section of views on the changes proposed, including:

- Acceptability to their interest group;
- How they think the changes will impact on the up take of the scheme?

Proposed changes are presented to each group and feedback is gathered which informs an updated list of credits for further comments and consultation. Following these stages, the credits are developed and worksheets/training manuals produced. Throughout the development process, the work is also subject to internal BRE Quality Assurance.

At each annual review, the BRE considers the latest technical development and best practice advice in the EcoHomes categories and then determines whether there are any omissions which could be practically implemented before producing a proposed list of changes. This is done through liaison with BRE and other experts in each area, assessors and stakeholders, and is interlinked with the work done on market acceptability. The BRE also considers whether there are other sections which could be practically introduced. There are a number of general principles BRE uses in developing potential credits:

- Can the credit be clearly defined?
- Is it measurable?
- Is it practicable?
- Is it achievable?

The BRE state that the review process is a significant undertaking, and very necessary in ensuring both buy-in to the scheme and that the scheme remains up to date. The current level of consultation is achievable for a yearly review, levels of consultation used in, for instance, the Building Regulations would not allow this system to operate.

15.7 Accessibility, legibility and appearance

Following stakeholder consultation and research into existing energy and eco- labels, it is apparent that a future sustainability label for homes will need to presented in a clear and accessible format to increase sector-wide understand and acceptance. Accessibility and legibility is a key part of any scheme, and is the basis for EcoHomes.

It is our conclusion that the label should have a tiered format comprising three levels of information and detail presented in a transparent manner. The stages would be: A-G Headline Score, Background Criteria Scores, and the Detailed Report

[18] The EcoHomes steering group is made up of the key stakeholders, including private and public sector developers, NHBC, Housing Corporation, clients, key environmental interest groups and an assessor representative.

15.8 A-G Headline

This element of the label would indicate the overall score for the home, this figure/alphanumeric would represent the equivalent of the 'A-G' figure on the EU energy label. We believe that this classification methodology would be universally understood by the sector, and would provide an easily-accessible figure for consumers to review the sustainability of a product 'at a glance'. The A-G EU energy label is gaining significant market acceptability and consumers are familiar with its form.

15.9 Background Criteria Scores

This section would contain the individual scores for each of the assessment criteria (equivalent to the 7 sections under the current EcoHomes format). **These scores would provide the next 'level of information' within the label format and would be aimed at consumers wanting more detailed information on how a home scores on a particular sustainability criterion.** Although this data is presented for closer inspection, we believe that it is important that the graphical format of the results is clear to allow easy comparison by the consumer.

Currently EcoHomes gives a rating of Pass to Excellent, with no breakdown of results included on the certificate. However, full details are given in the report produced for each development. The presentation of the Background Criteria Scores might be in the form of a number of stars, boxes/dots filled in or bar chart. BioRegional and BRE have discussed the potential of a format that follows an excepted example akin those used in publications such as '*Which?*' reports or *'What…'* magazine. An example of how this might look is given below (this is the scale and representation used by 'What Car').

Energy	●●●○○
Transport	●●○○○
Infrastructure	●○○○○
Waste	●●●○○
Water	●●○○○
Land use and ecology	●●●○○
Health and well being	●○○○○
Food	●●●●○
Consumer items	●●○○○

It should be noted that the BRE would wish to undertake market testing to ensure ease of use and market acceptability before introducing any similar type of addition to the EcoHomes certificate.

15.10 Detailed Report

The third and most comprehensive stage within the label would be the detailed report. This document would contain the specific information and observations made by the assessor and would justify how the scores were calculated. This document would also contain detailed information on the scheme and the issues surrounding sustainability in the

homes sector, there is also the possibility for this element to include a brief section covering suggestions and recommendations on possible home sustainability improvements.

In previous versions of EcoHomes and other BREEAM schemes, the BRE has included far more information on the certificate, beyond what is being suggested here. This proved unpopular with the users, as they are often not interested in the detail and was removed for clarity.

16 Further research

16.1 BioRegional recommendations for further study are indicated throughout this document

16.2 BRE Recommendations for further study

- DEFRA to fund BRE to develop an environmental rating scheme for existing homes, which is practical to use at the individual dwelling level. This would have to include:
  - Development of criteria
  - When assessments would need to be carried out, e.g. at change of ownership
  - The QA and monitoring procedures, building on lessons learnt from EcoHomes and the carrying out of building surveys
  - The method of implementation of an existing homes environmental rating scheme, e.g. through building society requirements, tamp duty etc. This would include reviewing all options, and considering the advantages and disadvantages for different stakeholders

  For each of these the market acceptability will need to be investigated, and used to inform the decisions made.

- DEFRA to fund BRE to review the market implications of altering the certificate, including:
  - The introduction an A-G style rating, either in conjunction with the Pass to Excellent or superseding it, and to determine the best option
  - Inclusion of more detail on the certificate (e.g. performance across all categories)
  - Production of a summary page of information which is issued with the certificate and is complementary

  For each of these the market implications will be assessed and the most appropriate solution proposed. Potentially, this will be reviewed against both new and existing homes requirements.

- DEFRA to fund BRE to review the different methods of introducing EcoHomes for new homes, e.g. through planning or Building Regulations, the implications and level of reliability of both of this and a proposed way forward. This would need to cover a range of issues including:
  - Market acceptability
  - The ability to influence design
  - The awareness of those professionals involved (e.g. building control, development control)
  - The training requirements
  - Additional guidance and support needed

- BRE to review the weightings within EcoHomes. This would consider a range of issues including:
  - Collation of better and more complete data
  - Methodology for generating the weightings
  - Means of up dating information

- DEFRA/ODPM to fund a study to demonstrate how eco ratings and sustainability can be introduced into planning requirements under current and proposed legislation. This would need to include at least:
  - Where the hooks are within planning guidance
  - Implications under appeal
  - Getting the planning inspectorate and government offices on board
  - Examples

  This could be carried out by a partnership including BRE, planning specialists, and planning lawyers.

16.3 SEI Recommendations for further study

This study shows that the EF is a powerful, unique and appropriate tool to measure the sustainability implications of both the construction and housing industry as well as different lifestyles of residents. It is an aggregated indicator that is responsive to the consumption of energy, water and materials, be it in the home construction process or the private consumption of products and goods.

However, not all necessary areas are equally well researched. In order to improve the accuracy, robustness and credibility of the EF tool there is a need for further study in the following areas:

- One very crucial issue in the calculations is the embodied energy of materials, goods, services and food. There is a lack of (publicly available) UK specific data on construction materials and pre-fabricated construction products. Data from different case studies – including data from abroad and from different years – have to be applied instead. For food, data on embodied energy and land use can vary widely, thus making it difficult to apply the appropriate value especially when there are local characteristics.

- The analysis does not look at refurbishment of buildings explicitly. This is an important part of living in homes. Partially and implicitly, refurbishment is included in the consumption of consumable items like wall and floor coverings, paints or carpets. It is also included in the component INFRASTRUCTURE (rest) where all construction materials are included except those used for new house building.

- Construction and demolition waste as well as recycling of building materials has not yet been included in the analysis. More detailed data on waste arising and recycling rates in this sector are needed in order to account for additional impacts or savings through recycling.

- The EF can also be used as a decision-making tool. Different options or policies in construction projects can be modelled in advance thus making EF an evidence-based scenario tool.

- Due to the limited resources of this study no sensitivity analysis of data and results was undertaken. It would be desirable (and possible with more resources) to add error ranges to the results.

- As mentioned above the footprint for the whole service sector (commercial and public) is not very developed yet. Further research is needed to convert Monetary Input-Output Tables (MIOT) into Physical Input-Output Tables (PIOT) or to find other appropriate proxy methods.

- This study has investigated the potential reduction in the EF that can be made by "consumers". A more comprehensive study could identify the role that other stakeholders could play in reducing the EF (such as industry and the various levels of government). Overall, this could identify a larger reduction in the EF with the introduction of more stakeholders.

- The data and analysis within this project could be used for a number of functions. Inserting the results into a software tool that could provide both educational value and policy outputs could be useful. Such a tool could be used to describe individual policy measures and to combine these into alternative scenarios. A series of individual measures could be developed including a renewable portfolio standard, appliance efficiency standards, and low-emission vehicles etc. These and other measures could be examined individually and then combined into integrated scenarios that capture their interactions. This would enable the creation of a wide range of scenarios for fashioning comprehensive strategies and for assessing the sensitivity of results to uncertainty in key variables.

Apart from these open research questions and ideas, which will help to improve the tool, EF is already suitable in its current form to form part of assessments under future eco-rating schemes for homes and lifestyles. Its design allows it to be presented to a wide audience and helps to understand the relations between resource consumption and environmental impact, thus helping to monitor and increase the level of sustainability.

Appendix: Stakeholders consulted

Local Authority Planning Departments

- **London Borough of Merton**

This borough claims to be one of the 'greener' London boroughs. Housing in the borough is said to be of a high quality with a wide range of properties from starter flats to large family homes.

- **London Borough of Barnet**

The Planning System in Barnet aims to maintain and improve the environment and appearance of the borough, promote the vitality and viability of town centres and encourage economic development.

- **London Borough of Croydon**

The Planning and Transportation Department is committed to maintaining and improving the economic and social well being of all the people in the borough within a sustainable, safe and high quality environment

- **Brighton & Hove City Council**

In April 2002 the council launched its sustainability strategy. Its purpose is to provide a framework for improving our environment and the quality of life enjoyed by people who live in, and visit Brighton & Hove. The strategy sets out the council's commitment to take action for a more sustainable future and is intended to provide a starting point for a Local Agenda 21 for Brighton & Hove.

Private Developers

- **Miller**

Miller Homes develops homes for private developers throughout the central belt of Scotland, the North East and North West of England, Yorkshire and the Midlands, and has established itself as a major force in the housebuilding sector.

- **Countryside Properties**

A development company focused on the development of sustainable communities and urban and rural regeneration. The Group operates mainly in London and the South East, the South West and North West of England. Private housebuilding is at the core of the Group's activities. The residential division of Countryside Properties and Copthorn Homes are responsible for housebuilding.

- **Crest Nicholson**

Crest Nicholson is a residential development company operating mainly in areas of high population density in Southern England. The combination of demographic pressure for new homes and stringent planning requirements is creating a long-term land shortage. According to Crest Nicholson their mission is 'to meet customers' expectations through the provision of environmentally sensitive and well built developments'.

Architects

- **PRP**

PRP's key in-house services are masterplanning; urban design; project management; landscaping; sustainable design and architecture. Whilst making the best use of available land, PRP aim to integrate sustainable principles with innovation and affordability.

According to PRP, sustainability is integrated into all aspects of their work. PRP aim to help clients to ensure their projects protect the environment, minimise pollution and conserve resources to safeguard the needs of future generations. Members of the Construction Industry Environmental Forum and the National Home Energy Rating Scheme, PRP have considerable expertise in designing buildings for minimum use of energy and water.

- **Panter Hudspith**

Panter Hudspith are committed to creating high quality modern buildings that respond sensitively to their environment but remain unquestionably of their time. The practice was started in 1987 with an aim to confront design problems in an innovative way, and to date have received awards from the RIBA and Civic Trust, and recognition from both English heritage and CABE. They aim to encourage productive interaction between client, consultants, contractors, and local and national authorities at all stages of the design and construction process.

- **Aukett**

Aukett Europe is an international group of architects, designers and engineers with offices in most major cities, including London. They offer creative design consultancy with commercial awareness and an ability to deliver high quality service through local offices.

Housing associations

- **East Thames Housing Group**

East Thames Housing Group is a charitable housing association and a registered social landlord. East Thames is focused on regeneration, building homes, services and communities to improve people's lives. They operate throughout East London and Essex, but most of their work takes place in the boroughs of Newham, Tower Hamlets, Waltham Forest and Redbridge. In total they own around 10,000 flats and houses, and look after more than 25,000 residents. The flats and houses that are built, bought or rented by East Thames are used to help those on low incomes to find an affordable home.

- **The Peabody Trust**

Peabody is one of London's largest housing associations, providing over 19,500 homes across the capital. Unusually, it has its own Act of Parliament, stipulating the Trust's charitable objectives to work solely within the London region for the relief of poverty.

The Trust is also a leading force in the regeneration of London, working to provide people with affordable housing in thriving, sustainable communities. They involve residents in the management of their own estates - and in Peabody as a whole. From tenants associations, giving tenants a voice at estate level, to a committee feeding into Peabody policy, residents are involved in the decisions that affect their homes.

- **The Hallam Housing Society**

This society is based in Sheffield, the majority of their stock is located within the Yorkshire conurbation, the society owns approximately 1100 homes all of which are within 25 miles of Sheffield. 82% of their properties are flats, houses accounting for approximately 13% of stock and are relatively new.

Contractors

- **Taylor Woodrow**

Taylor Woodrow is an international housing and development company employing over 6000 people worldwide. Their primary business is housebuilding. They build homes in the UK

through the Bryant brand and have operations in the US, Spain, Gibraltar, and in Canada through the Monarch brand. They focus on their customers' aspirations, designing homes with their customers' needs in mind

Component suppliers

- **Ashwells**

Ashwells supply second hand timber, hardwood & softwood, flooring, T&G, beams up to 12in x 12in, and railway sleepers. The company was established in1991 and is based in Bulphan, Upminster in Essex.

- **BP Solar**

BP Solar is one of the world's leading solar photovoltaic (PV) companies. In the UK, BP Solar is the market leader with around 4MW of solar PV products and systems installed. The PV industry in the UK is in its infancy and stands at a tiny fraction of other markets in Japan, Germany and the United States.

Estate Agents

- **FDP Savills**

FPD Savills has been the leading name in the UK Residential property market for generations. With a network of 47 residential offices throughout the UK they are recognised as setting the standards in the sale, purchase and letting of quality residential property. Their 30 regional offices handle country properties of all kinds, including stately homes and large estates ranging in value up to £15m, while their sixteen London offices provide the full range of agency services for prime London residential properties.

- **Andrews**

Andrews Estate Agents is the 14th largest estate agent in the UK with 39 branches throughout the South West and South East of England.

- **Frosts**

Frost Brothers Ltd has been property professionals in Surrey for over 40 years. They have branches in Croydon, Purley, Banstead, Selsdon, Sutton, Tadworth, Wallington and Wimbledon.

Surveyors

- **Ash Chartered Building Surveyors**

Ash surveyors provide a range of services for residential, institutional, industrial and commercial property; owners, tenants and landlords; lenders and insurers. They are based in Wallington, Surrey and Tonbridge, Kent. The majority of their work is carried out in London and the south east of England. They carry out structural surveys; defect investigation; new build maintenance and refurbishment works; expert witness and disputes; party wall matters; dilapidations/schedules of condition; disabled adaptations; and local authority grant work.

- **Jacqueline Sullivan**

Jackie is a part time surveyor based in Surrey, and a member of the Royal Institute of Chartered Surveyors where she is on the board of the environment faculty.

- **Mitchell Associates**

Paul Mitchell is a consultant surveyor based in Balham and Tooting.